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"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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T. BUTTERFIELD,

Minister of Agriculture.

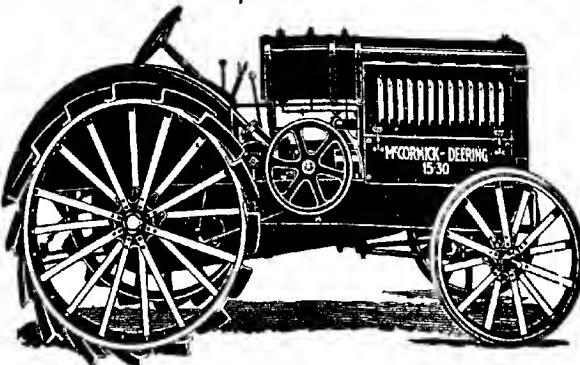
POINTS FOR PRODUCERS.

Dairying and Pig Raising on Eyre Peninsula.

It is anticipated that the establishment of freezing works at Port Lincoln will give an impetus to dairying and pig and lamb raising in the neighborhood, and farmers there have already sought the assistance of the Department of Agriculture with the object of securing guidance, more especially in relation to the type of animals most likely to meet requirements. Accordingly, arrangements have been made for a series of lectures and farm to farm visits by the Assistant Dairy Expert (Mr. H. J. Apps) and the Wool Inspector of the School of Mines (Mr. A. H. Codrington). These officers will visit Eyre Peninsula during June, and will address meetings at Green Patch, Big Swamp, Edillilie, Lake Wangary, and Port Lincoln. Branches of the Agricultural Bureau in the neighborhood are responsible for local arrangements.

The Agricultural Bureau.

The Department of Agriculture has issued a Bulletin written by the Secretary of the Advisory Board of Agriculture (Mr. Harold J. Finnis), dealing with the Agricultural Bureau of South Australia. The bulletin is published primarily for the guidance of hon. secretaries of Branches of the Bureau, but it contains an amount of information of general interest in relation to departmental activities. Dealing with the institution from the historical point of view, it mentions that from a humble beginning with five Branches and a membership of 53 in 1888, the Bureau has grown to the extent of 221 Branches, with a membership of 6,182. Discussing the institution in its relationship to the Department of Agriculture, Mr. Finnis points out that the Agricultural Bureau is part of the Department of Agriculture. It provides the point of contact between the agriculturist on the one hand and the expert officers on the other. It is the principal channel by means of which the Department of Agriculture can distribute knowledge gained in the course of its research and investigational work on the experimental farms, in the field plots, and in the laboratories. It would appear that whilst practically all civilised countries of the world have found no inherent difficulty in establishing and equipping with an adequately trained staff, institutions for agricultural research, an almost general difficulty has been to interest agriculturists in such institutions. Even within the boundary of the Commonwealth itself are to be found illustrations of this at the present time. Fortunately, in South Australia, this difficulty has never been a pressing one, because here an organised body of agriculturists, seeking guidance on technical agricultural matters, existed before the department was established to provide that help. Recognising the undoubted advantage that these circumstances presented, the Department of Agriculture has set itself to cultivate to the fullest this institution which is found ready at hand for its extension and propaganda work. For this work the Agricultural Bureau is particularly fitted. It provides the department with an organised centre in every district.



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in which there is a Branch. Thus, when occasion arises, it is possible to establish contact with the agriculturists of a district in a body, an economical and efficient method when compared with the dissipation of time and effort involved in an individual canvass. And because of this fact, it enables a relatively small technical staff to accomplish much more than it could were there no such organisation available. Hence the Department of Agriculture looks upon the Branches of the Agricultural Bureau as its outposts in the rural districts. It seeks the co-operation of the Branches in every way possible, in the arrangement for visits by technical officers, in the planning and conduct of experimental tests, and in the collection of data on local agricultural matters. It encourages the local Bureau to seek its aid on behalf of members desiring advice on all problems affecting their stock and their crops, in health and in disease. It encourages them to visit, as individuals or as bodies, the Experimental Farms and Orchards, demonstration and experimental plots under its control. And, above all, it seeks to cultivate through the medium of the Bureau, that mutual understanding and respect, without which it would be difficult, if not impossible, for the Department of Agriculture to perform the functions which justify its existence.

Fodder Crops in the South-East.

The reduced price being received for malting barley is leading farmers in districts in which this is the principal crop seriously to consider the wisdom of a change in their farming practices, and adopting other crops for their holdings. This is notably so at Milliecent, and as this district is well adapted to the production of livestock, much thought is now being given to fodder crops. The value of the peaty land of the Milliecent district for this purpose was recently demonstrated to the Superintendent of Experimental Works of the Department of Agriculture (Mr. W. J. Spafford), on the holding of Mr. F. A. Edwards, where very high grazing returns have been secured from a field of rape. In a field of about 80 acres in extent, about 50 acres of which consist of peat, 40 acres of the peaty land was sown with a mixture of rye and rape in the autumn of 1923, and although the block has been grazed continuously since September, quite half of it is still covered with a dense growth of rape about 4 ft. in height. In September, 800 sheep and 41 head of cattle were turned on to the field, and after being withdrawn for one week in that month, were returned, and have been grazing it continuously ever since. The pasturing of this number of livestock for a full six months shows a grazing value for the whole 80 acres of the equivalent of about 7 sheep per acre per year, and as the 40 acres of the field not sown to fodders certainly did not carry so much livestock, the rye and rape must have already carried the equivalent of 9 to 10 sheep per acre per year, and much good pasture still remains. The stand of rape was so thick and so high that sheep could not get into it, but were forced to graze around the edges of the crop until the cattle had made tracks through it, and even then the outer edges of the crop have been fed right down, whereas in the centre of the block the plants

of rape are 4ft. and 5ft. in height. Mr. Edwards has also had good results from Italian rye grass, and is now seeding land to subterranean clover in an effort to improve the pasture of the high land surrounding the peat swamps.

Milk Fever in Cows.

To a correspondent, Mr. Allan H. Robin, B.V.Sc., Government Veterinary Officer, has supplied the following information with respect to milk fever in cows, its cause and treatment. "The actual exciting cause of this condition is as yet somewhat obscure, though the conditions under which it appears are well known. It is essentially a disease resulting from domestication of the cow, and it is the heaviest milkers which are more prone to the disease. It appears in cows only at or shortly after calving. It may attack cows in low condition, though it is more common in cows in good condition. Heavy feeding just prior to calving, and lack of sufficient exercise predispose to an attack of it, and the risk of contracting the disease is great if the secretion of milk has been suspended for some time before calving, the cow meanwhile receiving the same amount of good food. Special apparatus is provided on the market, known as "milk fever outfits," for satisfactory treatment of this condition. With this apparatus, and observing strict cleanliness, sterile air is pumped into all four quarters of the udder of the affected cow until they are well distended. Tapes are tied round the teats to prevent leakage, and the inflated udder massaged. The animal must then be propped up with bedding or sacks filled with straw, chaff, or earth, so that she is kept sitting up on her brisket. It is fatal to allow her to lie flat on her side. If this treatment is carried out promptly and thoroughly, the animal generally pulls round within 24 hours. After recovery, give her a good drench of Epsom salts, and keep her on half rations for two or three days. The udder should not be stripped right out for two or three days after an attack, or the animal will probably suffer a relapse, from which it is more difficult to effect satisfactory recovery.

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INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

[Replies furnished by Mr. A. H. ROBIN, B.V.Sc., Stock and Brands Department]

"P. B.," Lyndoch, has cow due to calve in fortnight. The cow is being dried off. The milk is lumpy, and the teats show signs of becoming blocked.

Reply—Evidently your cow has an attack of mastitis, and such a sequence as you fear might occur. You would be able to lessen the chances of this occurring by occasionally passing a sterile milk catheter up each teat to keep it free from any blockage forming, particularly at the base of the teat. This manipulation must be conducted with the greatest possible care, otherwise you may only aggravate the manuities. Before operating on the teats in the way suggested thoroughly wash them so that they are quite clean on the outside, particularly round the teat openings. See that the milk catheter is thoroughly sterilised by boiling before passing it up the teats, and sterilise it again each time immediately after each teat is treated and before going on to the next one. Do not forget to have thoroughly clean hands. Pass the catheter and manipulate it gently in attempting to keep the duct clear of blockage.

"P. F. L.," Mount Barker, reports mare off feed, walks and lies down if in pain. Has difficulty in passing manure, and at times rests on her haunches like a dog.

Reply—Feed your mare only on light easily digested food. Give her a drachm of raw linseed oil $1\frac{1}{2}$ pints, turpentine 2oz. Have some of the following powder made up, each containing nux vomica 1 dram, powdered gentian root 3 drams and give her one of these night and morning for a week, then leave off for two or three days, and if necessary repeat. Give the powder half an hour before feeding, and the best way would be to mix the powder up with a spoonful of treacle or molasses to make a stiff, sticky paste, and smear it on the back of the mare's tongue and back teeth so that it sticks there, and she has to lick it down. Also give her, night and morning, immediately before feeding, or about an hour after feeding, one teaspoonful of dilute hydrochloric acid in half a pint of cold water.

Hon. Secretary, Waikerie Agricultural Bureau, reports milk from cows turning pinkish or blood stained after being in milk about a fortnight; cows in good condition, and fed on lucerne.

Reply—Milk being pinkish or blood stained when drawn from the udder may arise from injury to the udder or over-rich feeding. In your case, I would suggest that you reduce their ration of green lucerne and substitute some dry feed in its place. The feed ration, as a whole, could be somewhat reduced. There should not be any need for further treatment, save that a good dose of physic (Epsom salts 1lb., molasses $\frac{1}{2}$ lb., ginger 2oz., water $1\frac{1}{2}$ pints) to each of the cows would help towards a clearing up of the trouble.

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MOODY

"J. R. B." Wynarka, seeks (1) treatment for horse with hard swollen knee, caused by a kick, and (2) the difference between a stallion and an entire.

Reply—(1) Re horse with swollen knee. It is improbable that any treatment will be efficacious in reducing the swelling on the knee, but the most suitable to make an attempt with would be to clip the hair short over the area of the swelling, and rub well in for 15 minutes some red mercurial blister, made up a strength of one to eight. Apply in the early morning, and keep the animal tied up short until evening. The following day, wash off with warm water and soap, and smear on some vaseline or lanolin oil before turning the horse out. The blister may be repeated in four to five weeks' time. (2) Re stallion and entire. Both terms signify the same.

Hon. Secretary, Yadnarie Agricultural Bureau, reports several cows with ulcerations between teat and udder; flow of milk not affected. Cows had previously been milked with dry hands, and trouble commenced after milking with wet hands. (2) Man allowed to do heavy pull; next day udder was swollen. Feed has not been changed lately.

Replies—(1) "Dry" hand milking is in every way preferable to "wet" hand milking, being less liable to set up such trouble as your member experience as well as being the cleaner method. Wet bands are more liable to collect dirt and grit on them than dry hands, and chafe the teats. Many milkers are unfortunately prone to practise the wet method, because they find it easier in the dry, but when it is practised care must always be exercised to carefully dry the teats and lower part of the udder when milking is finished, and before turning the cows out back into the paddocks, where they are fully exposed to the weather. Wet teats exposed to cool winds blowing on them are liable to be chilled, and so become inflamed and sore. (2) The accident could be the result of a strain following upon heavy work. The owner should spell the mare out in warm, comfortable quarters, and feed on laxative food with a bath of Epsom salts added twice daily for a few days, and if the udder is very swollen apply hot fomentations, and gentle massage.

"K. M. B." Echunga, reports Jersey heifer showing loss of appetite a condition, ceased chewing the cud, walks with neck extended with head on one side; when lying down neck and head rest extended on ground; is able to swallow.

Reply—There would appear to be some trouble in the upper portion of the neck, just behind the head, in consequence of which it is painful for your to hold her head up in a normal position. Without the benefit of a personal examination one cannot offer any more precise diagnosis or suggest remedy. As the heifer is a valuable one, I think you would do well to obtain the services of a private qualified veterinary surgeon to visit and examine the beast.

Hon. Secretary, Agricultural Bureau, Talia, has horse with warts around eyes.

Reply—The eyes in horses form a favorite site for warts, which consist of simple diseased overgrowth (hypertrophy) of the surface layers of the skin. When they become rubbed, raw, and bleed, they will spread often very quickly. It is not that your grazing the animal on stony ground is helping to spread them through rubbing. It would be wise, then, to keep him off it. The eye should be washed with a little lukewarm boracic lotion to clear it up. If the warts are small and stick up, they may be removed by snipping them at the base with scissors, or by tying them round the neck with a piece of stout thread, which is left there till they drop off. In larger warts, the latter is the best procedure, as they are apt to bleed freely when cut. Their destruction can then be completed by daily application of a crystal of copper sulphate (bluestone) until the growth is completely removed. Care must be taken with those in close proximity to the eye that none of the bluestone is allowed to get into the eye. If you have no bluestone available, then a little vinegar on them would help somewhat to cause their disappearance.

"A. N." Shoal Bay, reports aged mare feeds irregularly, and often has discharges yellow matter from the nose. Rolls as if in pain, and bites her tail.

Reply—The mare has had an attack of indigestion colic, and there was probably a certain degree of impaction of the bowels. It would be advisable to give her a good laxative drench of raw linseed oil 1½ pints, and turpentine 2 oz.

POWER FARMING

The Question of the Hour.

An additional list of questions put to us by farmers is given below, together with our replies.

Question — *Will I get a bigger yield through using a tractor?*

Answer Here is an instance that happened in South Australia last season.

It relates to two experienced farmers whose farms adjoined with only an ordinary fence dividing the two paddocks. Farmer "A" was anxious to get a larger number of acres under crop. With that object he started his seeding early because time was short, but unfortunately, through having to depend upon horses, he began operations with the ground too wet. His neighbor, Farmer "B" was also anxious to put in a greater number of acres, but was able to wait until conditions were favorable. He was able to do so with perfect ease, because he owned a CASE tractor. This enabled him to do a greater quantity of work than Farmer "A" could get from his horses. Farmer "B" waited. The result at harvest time was striking. Farmer "A" reaped 7 bags to the acre, while Farmer "B" with his CASE tractor obtained 15 bags. His daily average number, reaped, bagged, and sown, was 289, his best day exceeded 300. Farmer "B" used a 15/27 CASE tractor with an extension steering control and an 8ft. reaper-thresher.

Question — *Will a CASE tractor enable me to put more under crop with the same amount of labor?*

Answer On account of its economical running costs and the long periods it can go without a halt for spells, the CASE tractor, being a one-man outfit, enables the farmer to put a greater area under crop than can be accomplished by horses. The increased crop acreage means a consequent increase in income.

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 of hard fallow in 13 days"
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During the seeding I hitched to a 12ft. 6in. Massey Combine and drilled 650 acres. I went over all kinds of soil, grey, red, boggy, stony, and stumps, and the CASE always held its own."

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POWER FARMING.

Question—What other advantages can I obtain by using a CASE?

The Question of the Hour.

Answer One of the greatest advantages of the tractor often overlooked is the higher standard of living resulting from its use. Farm machinery started the movement towards better farming. The tractor, by bringing about higher development of machine methods means a still better agriculture. Less drudgery for man and beast is one way in which the tractor promotes a higher standard of living. Whether ploughing, seed- ing, harvesting, or doing any other heavy work, the drudgery is either greatly reduced or eliminated. Accomplishing greater results in fewer hours gives the farmer more time for making needed farm improvements or for mixing socially with his neighbors. The tractor is doing for the farmer what improved power and machinery has done for manufacture—making the work easier and more orderly; increasing profits and making them more certain. The control of CASE tractor power makes the farmer less dependent upon conditions and ensures greater yields by giving him the upper hand of unfavorable weather.

Question—Is the CASE suitable for a small farm such as mine?

Answer The CASE tractor is made in four sizes, designed to meet the needs of the smallest or the largest farmers. All sizes of CASE Tractors are in use in Australia.

Question—I would like to know more about the tractor; what it costs to work, and what other farmers are doing with it.

Answer You can obtain further information, and copies of unsolicited testimonials from hundreds of farmers who use the CASE tractor by writing to

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as I have only one draught horse and
one big light horse on the place. I am
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year, and I think I am safe in saying
that they will not exceed more than half
of that of horses, and they are less work.
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the bowels out thoroughly. Feed her subsequently on the sloppy feed for a few days after the effect of the drench has worked off. Put a handful of Epsom salts in the feed each day. Dissolve the salts in warm water, and use it to damp the feed. In addition to the sloppy feed, let her still have a ration of long hay of good quality.

"L. G. H." Borrika, has horse turns round as far as possible to the near side, and raises the near hind leg off the ground. Lies down, and doubles up the front legs. When standing, paws the ground with off front leg.

Reply—The horse is suffering from chronic indigestion, with repeated attacks of mild colic. As a first step to procure a return to normal, I would recommend you to have his teeth attended to. They are almost certain to require dressing, and when this is done, he will be able to thoroughly chew the food and prepare it properly for digestion. Give the following drench:—Raw linseed oil $1\frac{1}{2}$ pints, turpentine 2 oz., and see that this gives a good clearing out. Feed only on light sloppy food or green feed while this is working. After it has worked off, feed on light sloppy diet with not much dry hay. Supply the bulk instead with green feed. For a week put a handful of Epsom salts in the damp feed night and morning. Dissolve the salts in warm water, and use this to damp the feed. Put rock salt in the feedbox. Have the following powder made up:—P. nux vomica $\frac{1}{2}$ lb., P. rad. gentian $\frac{1}{2}$ lb., P. zingiber $\frac{1}{2}$ lb. Mix thoroughly together, and give him a tablespoonful twice a day, either in the feed, or if he will not take it that way—which is very probable—mix it in a spoonful of treacle, and smear the sticky mass on to the back of the tongue with a piece of flat stick, so that he has to lick it down, shortly before feeding.

"J. E. D." Meningie, asks—(1) Cure for warts on cow's teats, (2) Preparation to encourage growth of hair on the tail and mane of mare, (3) Time that should elapse after a sow has weaned a litter and the next service.

Reply—(1) These may be greatly benefited or entirely removed by smearing them thickly with pure olive oil after each milking. If they persist they may be cut off with a pair of sharp scissors, and the sore touched with a stick of linear caustic. They could then be oiled, and the caustic repeated as required, to prevent their renewed growth. (2) To stimulate growth of hair. Try the following:—Clip the hair as short as possible over the affected parts. Rub in vaseline or castor oil daily, and dress occasionally with the following liniment, which should be rubbed in well:—Tincture of eantharides 1 part, soap liniment 8 parts. (3) Be sow. Providing she is in good condition at the time she may be served at the first time she comes in season after weaning, or any subsequent time.

Hon. Secretary, Agricultural Bureau, Shonai Bay, reports bay horses with sores on nose and lips.

Reply—Bathe the sores with warm water and 1 per cent. lysol to remove any scabs or seales. After daubing them dry, apply tincture of iodine to them once a day.

"E. C. O." Penong, reports stallion with enlarged penis and scrotum; the swelling also extends up the belly and chest, also mare in poor condition. When worked or roused, breathes very heavily.

Reply—Be stallion. It is impossible to definitely ascribe cause to the animal's condition, but it frequently occurs in stallions due to heavy feeding, lack of exercise, and excessive service. It may arise from a dirty sheath commencing irritation, from congestions of the penis, from blows or injuries. Satisfactory treatment generally results from the early administration of a good purgative, either an aloe's ball or 1 lb. to $1\frac{1}{2}$ lbs. Epsom salts as a drench. Subsequently the animal should be kept on sloppy diet, and receive a handful of Epsom salts in the food night and morning for a week. The inside of the sheath should be kept well cleaned out, and the swollen parts supported by a soft pad soaked in an astringent lotion such as a weak solution of alum, and kept in position by a suspensory bandage tied over the back and between the hind legs. Even the frequent application of cold water by douching from a bucket or applied from a hose is very beneficial. If abscess formation tends to occur, it should be hastened by warm fomentations, and the abscesses lanced to provide drainage for matter that forms. The wounds require to be subsequently treated with antiseptic solutions. The pressure pads and suspensory bandages are most essential parts of the treatment. The animal will probably recover the use of the penis as he

regains condition, and the swelling subsides. Give him a teaspoonful of powdered *nux vomica* night and morning for a week as a help to this end. Mix the powder with a little treacle or molasses, and smear the resulting sticky mass over the back teeth and tongue, using a piece of smooth flat stick to do it with. If mare, it is quite possible that the animal has been strained internally, and has been touched in her wind (or broken-winded). There may be some heart disengagement, too. Knock off the linseed oil treatment. She will require a good spell on good feed. She may have 1 oz. of Fowler's solution of arsenic daily for 10 days, and then knock it off for a time. Have the following powder made up:—Powdered *nux vomica* $\frac{1}{2}$ lb.; powdered gentian radix $\frac{1}{2}$ lb., powdered ferri sulph. $\frac{1}{2}$ lb., one tablespoonful of this mixture twice a day, mixing the dose with a spoonful of treacle, and giving it the same way as advised for the stallion.

Hon. Secretary, Agricultural Bureau, Shoal Bay, reports (1) 12 year old mare which discharges white fluid when working, and (2) bay gelding, 12 years old, with red film over each eyeball.

Reply—(1) The mare has a chronic septic metritis (of the breeding bag), and being of so long duration is not likely to be cured. The condition may be kept down and reduced by repeated flushings out of the breeding bag with warm normal saline solution (one teaspoonful of common salt to one pint of water). This should be injected into the breeding bag through a piece of rubber tubing (so that it is put into the breeding bag, and not just into the back passage). After injecting it into the organ, try to get it to run out again, and if it does not return freely of itself, you may have to massage and press down on the breeding bag by passing an oiled hand into the rectum. After the salt solution is emptied out, inject, if you can get it, about one pint of the following solution:—Iodine 1 part, potass. iod. 3 parts, water 100 parts. This may be allowed to remain in the breeding bag, and it will gradually work its way out again. Repeat this treatment every two or three weeks—a very convenient time would be when the mare is in season, if she shows that condition at all. (2) Try the following lotion:—Zinc sulphate 2 drs., boracic acid 1 dr., distilled water 1 pint. Put a few drops of this lotion into the eyes four or five times a day, so that it runs all over the eyeball. Be sure to have it lukewarm before injecting. If possible, keep the horse in a dark box, or cover the eyes with a calico shade.

Hon. Secretary, Rapid Bay, asks—(1) Best age to put a young sow to the boar, (2) how long is a sow between periods, and (3) time between periods of heat in a ewe.

Reply—(1) A young sow should be at least 10 months old before being put to the boar. (2) Three weeks and she will remain "in season" for about three days. (3) An empty ewe will come "in season" again 17-20 days after she was last unsuccessfully served. She remains "in season" for one or two days only.

SUSPECTED POISONOUS PLANT.

Petition Agricultural Bureau forwards a few specimens of a plant which made its appearance in the district this year. Members of Bureau state that it is quite a new plant to them. Members were anxious to know whether this plant was dangerous to stock.

Reply—The plant forwarded has been identified by the Professor of Botany (Professor T. G. B. Osborn) as *Euphorbia drummondii*, a native weed widely spread over the State. It is commonly regarded as poisonous, but veterinary evidence as to its toxicity is not conclusive. The plant probably causes blight if eaten by empty animals.

STRAWBERRY CULTURE.

Blackheath Agricultural Bureau asks which is the most profitable strawberry to grow.

The Horticultural Instructor (Mr. Geo. Quinn) says "Melba" is looked upon as the best general purpose strawberry grown here. The plants should be set out early in June in deeply dug soil which has had a good dressing of rotten farmyard manure or bonedust. For early fruit in cold districts, plant on an eastern to northern slope; in drier and hotter districts, set them on south-western to southern slopes, or in flats for preference.

BLACK APHIS.

W. J. G., Prospect Hill, forwarded a cherry leaf with some insects attached. He asked the best way to get rid of the pest.

The Horticultural Instructor (Mr. Geo. Quinn) says the insects are black aphids (*Myzus cerasi*), which are usually found attacking the peach, almond, Japanese plum, and in South Australia less often the cherry trees, although, as the specific name implies, in Europe it habitually infests the cherry trees. The best remedy is tobacco and soap solution put on warm, repeating the dose two or three times with intervals of about two days between. If tobacco extracts are not available use kerosine emulsion, or even hot soapsuds made by dissolving 2ozs. Sunlight soap to the gallon of water.

TAKE-ALL INFECTION.

The Yadenarie Branch of the Agricultural Bureau asks:—"Is seed wheat taken from a crop which was badly infested with take-all more subject to disease the following year than seed taken from a non-infested crop?"

The Lecturer in Plant Pathology at the University (Mr. Geoffrey Samuel, B.Sc.) supplies the following information:—

I have to state that wheat taken from a crop which was badly infested with take-all will not, if properly cleaned, be more subject to disease the following year on that account. The following points should be noticed in this connection, however:—

(1) Infection by the disease can be carried through the smallest pieces of leaf-sheath or straw from the bases of diseased plants, so that wheat stripped and winnowed from a heap in the middle of a paddock is more likely to contain infection than wheat gathered with a harvester. I should think that pickling would get rid of much of this infection; but no experiments have been done on this.

(2) There will be a considerable amount of partially shrivelled grain from infected plants near the edge of the take-all patches. This grain does not carry the take-all infection, but would not be expected to be such good seed as plump grain.

(3) Late wheats, i.e., those sown early, seem more liable to infection than the later-sown wheats; for if there is take-all in the land much of it germinates with the first rains, and dies if it finds no wheat to grow upon. Later sown wheats may thus escape much infection to which earlier-sown wheats would succumb.

SCAB ON APRICOTS.

Blackheath Agricultural Bureau asks—"Is there any effective method of preventing or removing the seal from apricots?"

The Horticultural Instructor (Mr. Geo. Quinn) advises spraying the trees with Burgundy or Bordeaux mixture just when the leaves have nearly all fallen in autumn, before pruning, and again in spring when the flowers are commencing to open.

WHOLE MEAL BREAD.

Blackheath Agricultural Bureau asks—"Where wheat is ground on the farm for making whole meal bread, is one variety of wheat better adapted than another?"

The Departmental Miller (Mr. G. H. Stevens) intimates that little definite information is available on this point. In making white bread it is found that a mixture of strong and weak flours gives the best results, and he suggests following the same practice in the case of whole meal. The main essential, however, in his opinion, is to select a good, clean, and plump sample of wheat, and, if necessary, to wash and thoroughly dry it.

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ROSEWORTHY AGRICULTURAL COLLEGE HARVEST
REPORT, 1923-1924.

[By W. J. COLEBATCH, B.Sc., M.R.C.V.S., Principal; R. C. SCOTT,
Experimentalist, and E. L. ORCHARD, Farm Superintendent.]

(Continued from page 851.)

BARLEY CROP.

As intimated at the commencement of this report, the season precluded us from sowing barley in the farm fields. We had, however, an area of 5.35 acres under this crop in one of the experimental fields and moderate yields were obtained. The average return over this area was 19bush. 37lbs., which brings the mean barley yield for the past 20 years to 28bush. 21lbs. per acre.

TABLE XVI.—*Showing Yields of Various Species and Varieties of Barley, 1923.*

Variety.	Selection.	Area. Acrea.	Total Yield.		Acre Yield.	
			B.	L.	B.	L.
Malting Barleys—						
Prior	4	0.710	16	32	23	32
Stucky	1	0.373	8	38	23	24
Duckbill	3	0.610	9	46	16	13
Larsen 32	1	0.970	12	16	12	33
Totals		2.663	47	92	17	40
Cape Barleys—						
Short Head	17	0.138	4	25	32	30
Roseworthy Oregon	16	1.022	24	36	24	9
Roseworthy Oregon	14	1.528	28	36	18	10
Totals		2.689	57	47	21	28
Grand totals		5.351	105	99	19	37

TABLE XVII.—*Showing General Average Barley Yields on the College Farm, 1904-1923.*

Season.	Rainfall.		Average Yield	
	"Useful."	Total.	Area.	per Acre
	Inches.	Inches.	Acrea.	Bush. lbs.
1904	11.60	14.70	27.86	38 33
1905	14.23	16.71	65.73	25 4
1906	16.31	19.73	51.00	40 38
1907	13.96	15.13	79.30	31 21
1908	15.52	17.75	94.83	43 49
1909	21.15	24.05	75.27	35 0
1910	16.79	23.87	113.42	37 9
1911	9.45	13.68	76.09	39 31
1912	13.05	14.97	123.82	22 21
1913	10.82	15.66	91.09	12 19
1914	6.12	9.26	12.85	2 26
1915	18.33	19.76	24.44	41 40
1916	20.25	23.23	129.198	12 15
1917	17.25	21.86	126.053	40 46
1918	10.53	12.01	109.660	23 5
1919	8.22	12.38	56.395	17 15
1920	16.76	19.30	105.010	21 30
1921	12.98	17.16	66.698	26 25
1922	14.90	20.00	54.103	37 38
1923	25.30	27.46	5.351	19 37
Mean for 20 years				28 21

OAT HARVEST.

Encouraged by the interest created amongst farmers by the introduction of new types of oats, the area under this cereal on the College farm has been gradually enlarged, and last year amounted to upwards of 100 acres. The demand for seed has been very keen, and although we have endeavored to place clients in the way of

securing supplies from other growers, many have been unable to obtain seed. It would be well if those who have been fortunate enough to procure clean seed were to acquaint the College with the amount of seed they have available for sale after next harvest, in order that their names may be given to applicants who ledge orders after our own surplus has been exhausted. With so many varieties to handle we cannot find room for large plots, and consequently are compelled to disappoint many who desire to purchase College seed. This position would be largely obviated if the plan suggested were acted upon, and it should have the effect of assisting growers to dispose of their grain at advantageous prices.

The average yield from all plots comprised in the 106 acres was 30bush. 23lbs., and the mean return for the 20-year period ending 1923 was 23bush. 37lbs. These figures are not high, but it must be remembered that Roseworthy is not an ideal oat-growing district, and varieties that do even moderately well here will usually give a much better account of themselves under cooler conditions. On the whole, however, the oaten crop of last season was above the average, although in other years individual yields have been higher.

TABLE XVIII.—*Showing the Average Oat Yield for the Period 1905-1923.*

Season.	Rainfall.			Area.	Yield per Acre
	"Useful," Inches.	Total, Inches.	Acres.		
1905	14.23	16.71	20.00	43 10	
1906	16.31	19.73	33.50	41 18	
1907	13.96	15.13	20.00	—	
1908	15.52	17.75	20.00	22 26	
1909	21.15	24.05	23.52	43 19	
1910	16.79	23.87	24.60	28 15	
1911	9.45	13.68	22.82	22 8	
1912	13.05	14.97	52.00	10 4	
1913	10.82	15.66	3.33	11 36	
1914	6.12	9.36	—	—	
1915	18.33	19.76	1.10	32 32	
1916	20.25	23.23	6.36	27 15	
1917	17.25	21.86	20.88	14 25	
1918	10.53	12.01	35.99	31 4	
1919	8.22	12.38	36.51	10 17	
1920	16.76	19.30	33.83	29 37	
1921	17.98	17.16	55.40	25 22	
1922	14.90	20.00	79.33	28 29	
1923	25.30	27.41	106.70	30 22	
Mean for 20 years				23 37	

Fourteen varieties were grown on Flett's field, and the returns ranged from 38bush. 31lbs. in the case of Sunrise to 20bush. 7lbs. from Yarran. The Sunrise plot was a very small one—less than half an

ac²—and this fact must be considered when comparisons are being made on the basis of the figures given in the appended table. Usually this variety proves only a moderate grain yielder, although it is a splendid oat for hay or ensilage. Setting aside *Sunrise*, it will be seen that *Kherson* and *Scotch Grey* gave the highest yields of grain, and the *Algerian* plot returned only 2-3 bush. less. It is in the very wet seasons that *Algerian* oats do best in this district, and consequently we did not expect to find the newer types much in advance this year; but under normal conditions they reap the advantage of brisk early growth, and their quick-maturing habit enables them to mature well-filled grain when the slower growing *Algerian* type is struggling against adverse ripening conditions. *Lachlan* and *Early Burt*, though less prolific than one or two others this year, have again given good results, as also have *Guyra* and *Mulga*. In the final column of the yield table will be found the mean returns for several seasons, and notice should be taken of these figures, as they may now be taken as reliable indications of the grain-yielding propensities of the different varieties under our soil and weather conditions.

TABLE XIX.—*Showing Yields of Varieties of Oats, 1918-1922.*

Variety.	1918.		1919.		1920.		1921.		1922.		1923.		Means.	
	B.	L.												
<i>Lachlan</i> . . .	—	—	42	29	57	6	41	22	39	20	31	19	12	19
<i>Scotch Grey</i> . . .	49	17	31	12	55	15	30	23	22	4	35	35	37	18
<i>Early Burt</i> . . .	—	—	48	3	36	27	26	15	31	1	28	31	34	8
<i>Kherson</i> . . .	29	29	22	19	55	9	25	16	32	8	37	9	33	28
<i>Kelsall's</i> . . .	17	28	33	3	49	2	39	1	27	27	20	19	31	7
<i>Sunrise</i> . . .	25	33	15	27	46	4	26	13	25	32	38	31	29	30
<i>Algerian</i> . . .	—	—	—	—	—	—	—	—	21	35	33	36	27	36
<i>Guyra</i> . . .	—	—	16	1	55	29	13	37	23	20	27	20	27	13
<i>Bathurst Early</i> . . .	—	—	37	16	31	7	19	9	17	19	20	17	25	6
<i>Mulga</i> . . .	—	—	—	—	20	0	24	1	22	23	31	29	24	23
<i>Quindong</i> . . .	—	—	—	—	36	4	12	39	20	12	23	25	23	10
<i>Yarran</i> . . .	—	—	21	15	34	21	14	6	29	29	20	7	22	0
<i>New Zealand</i>														
<i>Cape</i> . . .	—	—	—	—	—	—	—	—	17	18	24	31	21	5
<i>Glen Innes</i>														
<i>No. 1</i> . . .	—	—	—	—	—	—	—	—	—	—	26	39	—	—

The last table given in this section brings together the mean hay and grain returns for ready comparison. The position held by *Lachlan*, *Scotch Grey*, and *Early Burt* have not been altered by the recent harvest. Taking into consideration both hay and grain yields, *Early Burt* must be regarded as the best general purpose oat we have grown, but the advantages it possesses over *Lachlan* and *Scotch Grey* are not such as to warrant the opinion that the latter two will always prove inferior to it. Even on the College farm it is not at all improbable that as the trials go on the mean yields of these three oats will come much closer together, and under entirely different circumstances it

would not surprise us to learn that their relative positions had changed. We have, however, been working long enough with these varieties to be able to recommend them freely to farmers for both hay and grain. What is even more important to those who keep sheep is that they are all rapid growers from the start, and if sown early in the autumn (April), regardless of whether rain has fallen or not, they can be relied upon to furnish useful feed for ewes and lambs.

TABLE XX.—*Giving Average Hay and Grain Yields of Oat Varieties.*

Variety.	Period.	Hay per Acre.			Grain per Acre.	
		T.	C.	I.	Period.	S.
Lachlan	1921-1923	2	11	17	1919-1923	42
Scotch Grey . . .	1921-1923	2	13	2	1918-1923	37
Early Burt	1921-1923	3	2	11	1919-1923	34
Kherston	1921-1923	2	11	49	1918-1923	33
Kelball's	1921-1922	2	13	2	1918-1922	31
Sunrise	1921-1923	2	15	109	1918-1923	29
Algerian	1922-1923	2	5	58	1922-1923	27
Bathurst Early . .	1921-1923	2	11	71	1919-1923	25
Mulga	1923	3	0	2	1920-1923	24
Quandong	1923	2	18	34	1920-1923	23
Yarran	1922-1923	2	15	8	1919-1923	22

WHEAT HARVEST.

Wheat can adapt itself to climatic and soil conditions better than most crops, but even some of our most approved varieties failed to survive the trying circumstances which surrounded them last season. At the outset plans were laid for the sowing of about 300 acres of wheat, but only 170 acres of the fallow was utilised. The balance had to be abandoned owing to inundations, and an effort was then made to keep some of the varieties going by drilling freshly ploughed stubbles. In this, however, we were only partially successful, the drills having to be brought home without completing the amended programme. The total area sown was 184 acres, and the average return worked out at 15 $\frac{3}{4}$ bush., or practically 2bush. below the mean wheat yield for the preceding 20 years. It will be noticed in the summary that in three fields—Daly's B and C, Flett's A and No. 6C—the yields were well above the mean, whilst in the remaining two the crops were failures. It is not always an easy matter to account for the differences revealed in these tables, but in this instance it is possible to throw light on the question. In No. 5B, two small plots were cut out of a hay crop, as the grain crop area reserved for these varieties could not be sown. The crop in Grainger's B was a very early wheat, and in consequence was sown last. Weather conditions at that time were very adverse. The soil was saturated, the seed germinated poorly, and a very thin plant resulted.

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No. 6C is a field 24 acres in area; but we had to cease work after drilling about two-thirds of it. Fortunately, the dry side of the field was under crop, and although the stand was not very thick the crop filled well, and the return was satisfactory.

In the two larger fields seeding was finished by the end of May under fairly good conditions, and, moreover, the land in Flett's being of a light sandy character, is better adapted for growing crops in wet years than most of the farm fields. The highest yield amongst the bulk wheats was 22bush. 35lbs., from King's White in Daly's B and C, which was seeded during the first week of May. The remainder of this field that was allowed to stand for grain consisted of rising land, and was therefore less injured by an overplus of soil moisture than the crops in No. 6C and Grainger's B. It is unfortunate that the circumstances under which the records are taken cannot be brought more under control. The accidental factor is bound to impair the value of the season's results, since the allocation of the varieties to the different fields is naturally determined by such considerations as ease of management and convenience at harvest rather than by any attempt to fit them to any particular environment. The effects of untoward circumstances, however, whilst important from the point of view of the seasonal averages, do not seriously affect the mean figures derived from a long series of harvests. It will be noticed, for example, that Early Gluyas—one of the best grain wheats for early districts—yielded less than 10bush. this harvest, yet its mean return for nine years has only fallen from 23bush. 54lbs. to 22bush. 21lbs. Hence the importance of long continued trials in the quest for reliable grain-yielding varieties.

TABLE XXI.—*Summary of Wheat Harvest, 1923.*

	Area. Acres.	Total Yield.		Acre Yield.	
		B.	L.	B.	L.
Farm crops—					
Daly's B and C . . .	68.990	1,411	32	20	28
Flett's A	41.138	797	44	19	23
No. 6C	15.008	274	12	18	16
No. 5B	2.153	18	7	8	25
Grainger's B	31.535	154	35	4	54
Totals	158.824	2,656	10	16	43
Experimental plots—					
(1 acre and over) . . .	25.305	241	58	9	34
Totals	184.129	2,898	8	15	44
Experimental plots—					
(under 1 acre)	5.054	49	51	9	52
Grand totals . . .	189.183	2,947	59	15	35

TABLE XXII.—*Showing the Average Yields of Wheat on the College Farm, 1904-1923.*

Season.	Rainfall. "Useful." Inches.	Total Inches	Area Under Wheat. Acres.	Average Yield per Acre. Bush. lbs.
1904	11.60	14.70	330.00	18 3
1905	14.23	16.71	212.00	24 11
1906	16.31	19.73	318.00	14 30
1907	13.96	15.13	178.00	13 20
1908	15.52	17.75	258.52	22 14
1909	21.15	24.05	328.47	25 5
1910	16.79	23.87	267.35	16 38
1911	9.45	13.68	234.98	14 17
1912	13.05	14.97	232.89	19 36
1913	10.82	15.66	333.07	6 32
1914	6.12	9.36	148.69	11 28
1915	18.33	19.76	367.271	21 13
1916	20.25	23.23	330.937	24 44
1917	17.25	21.86	353.473	17 32
1918	10.53	12.01	320.326	17 36
1919	8.22	12.38	329.957	9 22
1920	16.76	19.30	341.542	26 57
1921	12.98	17.16	286.393	16 56
1922	14.90	20.00	305.078	16 6
1923	25.30	27.46	184.129	15 44
Mean for 20 years				17 36

YIELDS OF CHIEF VARIETIES.

Generally speaking, the later ripening and consequently earlier sown varieties yielded better results than earlier kinds. There were, of course, exceptions to this, as, for instance, Maharajah, which heads the list with 25½bush. per acre. Similarly Rajah, an early mid-season wheat, gave us 23bush. 51lbs., whilst Ford yielded 19bush. 30lbs.

Of the late wheats Yandilla King comes first with 23bush. 15lbs., and is closely followed with Marshall's No. 3, which returned 20bush. 31lbs.

The popular variety—Sultan—fell below its usual place for the year, but, notwithstanding this, it has proved the most prolific grain yielder over the past six years. In general, the order in which the other varieties appear has not been modified to any appreciable extent. It will be observed, on reference to the mean figures, the later varieties are still found congregating at the bottom of the list.

TABLE XXIII.—*Showing Yields of Chief Varieties of Wheat Grains as Farm Crops, 1915-1923.*

Variety.	1918.	1919.	1920.	1921.	1922.	1923.	Means	%
	B. L.							
Sultan	35 15	19 51	28 11	17 6	24 12	12 0	22 29	3
Early Gluyas	14 53	9 56	34 25	30 57	20 49	9 50	22 21	3
Caliph	27 29	15 54	27 46	21 20	27 28	13 48	21 24	3
President	30 4	18 41	25 22	11 47	28 27	18 16	21 7	3
Ford	14 32	19 12	25 23	15 18	20 46	19 30	20 46	3
Early Crossbred 53	15 41	9 21	38 5	15 5	21 46	16 51	20 43	3
King's White	15 30	13 54	22 20	13 16	22 55	22 33	20 21	3
Rajah	19 27	19 7	25 46	9 27	22 48	23 51	19 45	3
Felix	22 20	20 41	28 8	9 38	28 21	8 14	19 32	3
Maharajah	15 22	16 25	27 45	11 20	20 52	25 30	19 29	3
Faun	18 8	26 7	23 53	20 55	17 53	16 33	19 24	3
Vandilla King	19 10	9 47	27 36	9 47	24 12	23 15	18 32	3
Queen Fan	17 3	5 19	22 47	21 15	23 37	13 39	18 39	3
Late Gluyas	18 12	5 11	26 29	23 25	17 18	6 6	18 1	3
Federation	14 8	6 58	25 18	16 44	20 0	21 30	16 43	3
Marshall's No. 3	16 43	8 35	28 17	11 14	27 32	20 31	16 2	3

TABLE XXIV.—*Giving Average Hay and Grain Yields of Wheats Varieties.*

Variety.	Period.	Hay per Acre.			Period.	Grain per Acre.		
		T.	C.	L.		B. L.	B. L.	B. L.
Sultan	1920-23	2	6	85	..	1917-23	22	20
Caliph	1921-23	2	2	30	..	1915-23	21	24
President	1920-23	2	2	80	..	1917-23	21	7
Early Crossbred 53	1920-23	2	5	19	..	1917-23	20	43
King's White	1920-23	2	6	0	..	1915-23	20	21
Rajah	1921-23	2	8	14	..	1917-23	19	48
Felix	1920-23	2	5	79	..	1917-23	19	32
Maharajah	1921-23	2	7	71	..	1917-23	19	29

TABLE XXV.—*Showing Yields of Latest Strains of College Selected Wheats.*

Variety.	Selection.	1919.	1920.	1921.	1922.	1923.	Means	%
		B. L.						
Dan	5	39 34	22 6	24 39	20 16	15 28	24 25	3
Sultan	7	22 47	26 46	22 6	24 12	5 8	22 26	3
Caliph	8	19 56	29 11	16 10	27 28	13 48	22 35	3
Ford	9	19 12	25 23	22 58	25 33	7 30	22 6	3
President	7	20 23	28 4	21 3	28 27	6 26	21 23	3
Felix	7	20 41	27 10	22 59	28 21	5 20	20 54	3
King's White	18	21 40	32 39	15 49	22 55	15 2	20 22	3
Fortune	9	14 58	22 21	13 2	23 38	5 0	19 45	3
Emperor	7	16 40	14 41	15 30	26 12	12 16	19 33	3
Queen Fan	14	17 36	20 41	17 11	23 37	8 45	19 17	3
Federation	15	12 37	17 59	16 33	20 0	11 12	18 51	3
Faun	8	20 41	27 20	21 21	17 53	8 31	19 45	3
Rajah	7	17 35	19 53	14 32	22 48	17 37	18 34	3
Gluyas	18	20 42	22 4	17 0	20 49	9 50	18 31	3
Marshall's No. 3	17	18 11	19 43	18 23	27 32	6 45	18 12	3
Maharajah	7	23 23	15 31	19 6	20 52	10 56	17 43	3
Gypsy	5	22 10	23 50	14 49	21 21	6 14	17 41	3
Vandilla King	12	11 58	25 12	16 0	24 12	15 46	17 24	3
Late Gluyas	18	20 35	26 33	14 58	17 18	6 6	17 24	3
Early Crossbred 53	8	19 10	24 14	14 5	16 56	3 40	16 51	3

Interesting particulars of the new crossbreds raised at the College are given in Table XXVI. Several of the 1919 crossbreds give promise of developing into attractive types, but attention is specially directed towards the Federation and Guyas cross, which was found to be storm resisting to a greater extent than any Guyas crossbred previously produced here. It is hoped that this wheat, either directly or indirectly, will enable us to place on the market strains that will combine the high yielding capacity of Guyas with the rigidity of straw so characteristic of Federation.

Table XXVI.—*Showing Yields of Some New College Crossbred Wheats*

Serie- tion.	Pedigree.	Yield per Acre.				
		1920. B. L.	1921. B. L.	1922. B. L.	1923. B. L.	Means.
I.	Emperor x Caliph (1916)	25 30	22 39	24 22	13 20	22 13
II.	Anvil x Sultan (1916)	26 20	23 50	23 10	5 14	20 9
III.	Rajah x Guyas (1916)	23 27	18 19	23 38	14 44	20 2
IV.	Ford x Florence (1918)	—	—	21 53	16 59	19 26
V.	Ford x Guyas (1918)	—	—	20 25	10 33	15 29
VI.	Argentine White x Bonus (1918)	—	—	19 6	10 28	14 17
VII.	Felix x Tunis (1918)	—	—	—	13 20	—
VIII.	Federation x Guyas (1919)	—	—	—	31 49	—
IX.	Federation x Late Guyas (1919)	—	—	—	30 13	—
X.	Crossbred 53 x Sultan (1919)	—	—	—	30 0	—
XI.	Federation x Queen Fan (1919)	—	—	—	29 3	—
XII.	Crossbred 53 x Caliph (1919)	—	—	—	27 47	—
XIII.	Crossbred 53 x President (1919)	—	—	—	25 0	—

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ALDEHYDE IN FORTIFYING SPIRITS.

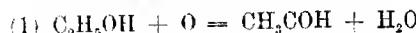
[By A. T. JEFFERIS, B.Sc. (State Agricultural Chemist), and
C. S. PIPER, B.Sc. (Assistant Chemist), Roseworthy College.]

Statutory regulation 84 of the Excise Act, amended this year by regulation 19, stipulates that spirit used for fortifying wine must contain less than 75 milligrams of acetic aldehyde per litre of absolute alcohol.

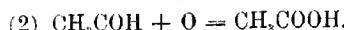
In view of the fact that many distillers in this State and elsewhere have found it difficult to keep economically within this limit, some investigations have been made at the Roseworthy College laboratory, the results of which have been thought of sufficient interest to embody in this note.

In the first place, it will be as well to examine aldehyde in its relation to alcohol and acetic acid from a chemical standpoint.

When ordinary or ethyl alcohol is oxidised the first product is acetaldehyde. On further oxidation acetic acid is formed. These reactions may be expressed by the two equations:—



Alcohol and oxygen = aldehyde and water.



Aldehyde and oxygen = acetic acid.

A little aldehyde is always formed in the fermenting vat together with traces of acetic acid, while on standing in wood additional aldehyde is developed. Therefore if an older wine be distilled the product will contain considerably more aldehyde than that of a newly made wine. That such is the case can be seen from a comparison of this season's wine with that of 1917, which stood for two years in wood before bottling. From a litre each of new and old Doradille wine the following results were obtained, on distillation, 100 c.c. being collected as foreshots:—

Vintage.	Foreshots, 100 c.c.			Hearts, Feints, and Residue, 900 c.c.			Total, 1,000 c.c.		
	Alcohol by Vol.	Aldehyde.	Aldehyde per Lit. of Alc.	Alcohol by Vol.	Aldehyde.	Aldehyde per Lit. of Alc.	Alcohol by Vol.	Aldehyde.	Aldehyde per Lit. of Alc.
	c.c.	mgs.	mgs.	c.c.	mgs.	mgs.	c.c.	mgs.	mgs.
1924	56	11	196	32	2	62	88	13	147
1917	59	18	306	56	10	178	115	28	244

Since aldehyde is the intermediate oxidation product between alcohol and acid, it should be produced on the souring of a wine. The following tests show this to be the case. The young Doradillo used above was inoculated with vinegar bacteria and allowed to stand in a warm place. The increase of acidity and aldehyde was noted:

	Acidity as Sulphuric Acid.	Increase of Acidity.	Aldehyde per Litre of Wine.	Increase of Aldehyde.
	Mgs. per lit.			
1924. Doradillo, sound	4,704		13	
1924. After five days	7,840	3,136	27	14
1924. After seven days	10,976	6,272	32	19
1924. After nine days	16,270	11,566	32	19

It has been contended that the use of an oxidising agent, such as potassium permanganate, previous to distillation or rectification will eliminate the aldehydes by oxidising them to acetic acid, and the custom amongst some distillers has been to add permanganate at the rate of 1lb. per hundred gallons to the neutralized wine, or to the distillate some hours before rectification. Though this action may take place, it is unfortunately more than counterbalanced by the additional oxidation of alcohol to aldehyde.

The following tests carried out on some rectified spirit purchased by the College will demonstrate this. Permanganate was added to the spirit in the proportion of 1lb. per 100galls., and after four hours standing the whole was distilled and the aldehyde contents determined. As the oxidising power of permanganate varies considerably with the neutrality of the solution, the spirit was treated in three portions:—

- (a) Acid.—Sulphuric acid added at the rate of 1gram per litre
- (b) Neutral.—The spirit was slightly acid and was made exactly neutral to phenolphthalein.
- (c) Alkaline.—Caustic soda was added at the rate of 1 grain per litre.

Original Spirit.	Permanganate Added.		
	Acid.	Neutral.	Alkaline.
Total aldehyde in mgs. per litre of absolute alcohol	22	119	67
Increase in aldehyde	—	97	45

[May 15, 1924]

This was repeated with permanganate at the rate of 3 lbs. per 100galls.

Original Spirit.	Acid.	Neutral.	Alkal.
Total aldehyde in mgs. per litre of absolute alcohol	22	222	130
Increase of aldehyde	—	200	108

The estimations were made colorimetrically with the use of Schi^z reagent. It appears, therefore, that—

- (a) The use of potassium permanganate increases the aldehyde contents of a spirit.
- (b) The increase varies greatly with the neutrality of the solution.
- (c) The increase is in a measure proportional to the amount of permanganate used.

On using potassium dichromate in the place of permanganate similar results were obtained.

To test the possibility of converting the aldehyde to alcohol by the action of a reducing agent, tests were made with ferrous sulphate and oxalic acid. Negative results were obtained in each case.

PHYSICAL METHODS.

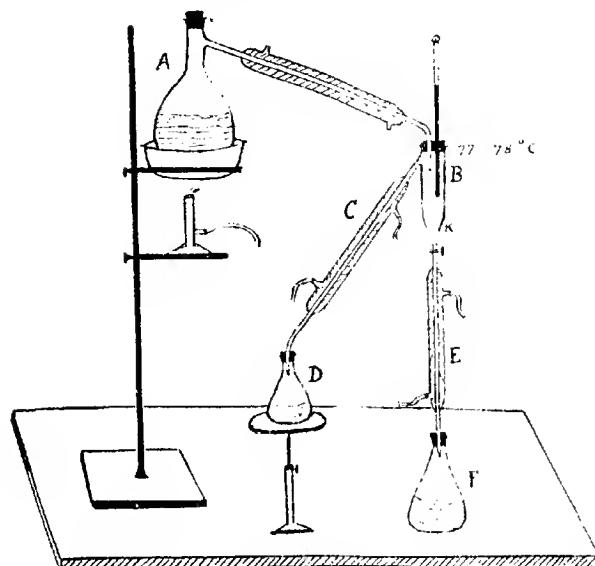
Acetic aldehydye has a boiling point of 21° C., while that of ethyl alcohol is 78° C. The vapour pressure of the former in solution is considerably in excess of that of alcohol, and on exposure at a raised temperature much aldehyde should be expelled.

Spirit containing 4,000 milligrams per litre of aldehyde was exposed to the air at a temperature of 60° C. for three-quarters of an hour. The aldehyde was reduced to 700 milligrams, but there was also a loss of 50 per cent. of alcohol.

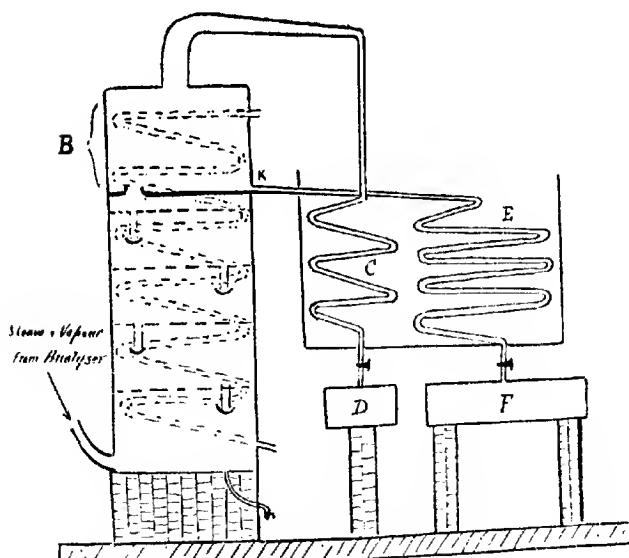
An apparatus was then arranged, as shown in diagram 1, to conserve this loss. In the first place the condenser E was omitted and the spirit condensing in B dropped hot into the open vessel F. The lighter portions of the distillate were condensed, caught in D, and constantly returned to still A. The final result of the distillation was as follows:—

Per Cent. Alcohol by Volume.	Milligrams Aldehydye per Litre of Absolute Alcohol
300 c.c. spirit distilled in A	91
240 c.c. distillate in F	90
45 c.c. heads, D	92

Decrease of aldehyde in main distillate 600 milligrams per litre
Loss of alcohol, 5½ per cent.; loss of aldehyde, 24½ per cent.



Diag. I



Diag. II

In industrial distillation the heads can be continually returned to the still. There must come a time, however, when their aldehyde contents have so increased that the resulting spirit would be too highly contaminated, and the heads must then be discarded.

The apparatus shown in diagram 1, if used continuously, is in many respects similar to a "Coffey" still, as may be seen by reference to diagram 2. The various parts are lettered the same as the corresponding parts in diagram 1.

It is suggested that by increasing the temperature of C and allowing the distillate to drop while warm into an open vessel, a large portion of the aldehyde would be lost in transit, and the contents of D could be returned to the still for a much longer period.

In the "Coffey" still this might be effected by shortening condenser coil C and lowering tank D. It is thus shown that by a process of distillation whereby the alcohol is condensed and withdrawn from the mixed vapors, at a raised temperature, an effective separation from aldehyde will result. As a matter of fact, continuous stills of the "Coffey" type are not giving much trouble in respect to aldehyde.

With the pot-still, however, the case is otherwise, as the "foreshots," representing about 10 per cent. of the distillate and a greater per cent. of the total alcohol, may contain from 800 to 2,000 milligrams per litre of aldehyde, and unless the subsequent rectification is very efficient in eliminating this, it is advisable to discard the "foreshots." They can certainly be utilised for vinegar by those running such a process in connection with their stills, but as the Excise allows only $2\frac{1}{2}$ per cent. loss during distillation, the man without a vinegar plant and working a pot-still or some other type where the aldehyde is not eliminated is at a considerable disadvantage.

SUMMARY.

1. The formation of small quantities of aldehyde by the oxidation of alcohol in a fermenting must is a normal process and aldehyde is consequently present in new wine.
2. This process continues during the maturing of a wine and the percentage of aldehyde rises.
3. When a wine sours additional quantities of aldehyde are formed.
4. The use of oxidising agents, such as potassium permanganate and dichromate, will not eliminate the aldehyde from a wine or spirit, but only results in an increase. This increase varies greatly with the neutrality of the liquor treated, and is roughly proportional to the amount of oxidising agent used.
5. Treatment with reducing agents, such as ferrous sulphate and oxalic acid, does not influence the aldehyde.
6. If a wine or spirit be subjected to fractional condensation the aldehyde contents of the main distillate are low, and the heads containing the bulk of the aldehyde can be continuously returned to the still until they are so high as to effect the main condensate.

7. Continuous stills of the "Coffey" type can be so arranged as to allow of the production of a fortifying spirit conforming to the Excise standard regarding aldehyde without undue loss of spirit. With pot-stills the difficulty is greater, particularly where the original wine contains a fair amount of aldehyde, as in the case, on the one hand with well-matured wine, and on the other, with sour wine.

Thanks are due to the following gentlemen for their advice: Mr. C. R. Churchward, State chief analyst, Customs; Mr. D. G. Quinn, State viticulturist, Roseworthy College; Messrs. Seppelt Bros., vigneron, Seppeltsfield.

BOOBOROWIE EXPERIMENTAL FARM HARVEST REPORT.

[By E. A. BRISTOW, Manager.]

This farm is situated 120 miles north of Adelaide, and contains 1,484 acres, with an altitude of 1,200ft. to 2,000ft. It consists of two blocks—one, the old North Booborowie homestead, is "high" land, running to the highest point in Brown's Hill Range, and part of the stock road, and containing 1,186 acres; the other (block No. 478), situated two miles from the homestead, containing 298 acres of comparatively level land, which in times of heavy rains is flooded by water from the Tumela Creek. This farm is situated in the centre of a very good district, which contains land suitable for (1) cereal growing, (2) lucerne growing without irrigation, and (3) some first class grazing land not arable. Typical cereal-growing land and grazing land constitute this farm, and although the recently acquired block of the stock road adjoining the eastern boundary of the homestead block contains about 20 acres of second-class lucerne land, unfortunately it does not include any of the first-class lucerne-growing land, of which many thousands of acres are to be found in this district, because in the growing and handling of this crop there is urgent need for experimental investigation.

THE SEASON 1923.

To the end of April only 57 points of rain were registered, but the dry spell ceased on the 5th of May, and good rains followed for the rest of the season as follows:—May, 2.77in.; June, 2.77in.; July,

4.28in.; August, 2.50in.; September, 3.17in.; October, 2.30in.; November, 0.28in.; and December, 2.53in. As will be noted the seeding and fallowing months were extremely wet, which rendered seeding operations very difficult. The total rainfall for the year was 21.17in.

Rainfall Distribution at Booborowie, 1900-1923.

	Means, 1900- 1918.		1919.		1920.		1921.		1922.		1923.		Means, 1900- 1923.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
January	0.49	0.23	0.22	1.25	1.23	0.26	0.26	0.22	0.26	0.26	0.26	0.22	
February	0.46	2.56	—	1.12	1.09	—	—	—	—	—	—	0.57	
March	0.82	0.05	0.51	1.75	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
April	1.00	1.35	0.79	—	1.69	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
May	1.64	2.42	0.96	2.47	4.14	2.77	1.83	—	—	—	—	—	
June	2.51	2.25	4.27	2.92	1.58	2.77	2.38	—	—	—	—	—	
July	2.00	1.36	1.88	2.46	3.31	4.28	2.14	—	—	—	—	—	
August	2.12	2.01	3.52	2.38	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
September	2.11	2.09	2.57	2.79	1.63	3.17	2.98	—	—	—	—	—	
October	1.68	1.44	2.11	1.60	0.70	2.30	1.67	—	—	—	—	—	
November	1.06	0.85	3.47	0.84	0.96	0.28	1.46	—	—	—	—	—	
December	0.93	1.78	1.92	0.92	2.24	2.53	1.13	—	—	—	—	—	
Total	16.83	18.39	22.22	20.50	20.32	21.17	17.00	—	—	—	—	—	
"Useful" rainfall (April-November)	14.12	13.77	19.57	15.48	15.61	18.23	14.82	—	—	—	—	—	

The total rainfall for the year must be considered good; it is above the average, as is also the "useful" rain.

Distribution of "Useful" Rainfall, Booborowie, 1900-1923.

	1923.		1900-23.	
	Means.	Inches.	Means.	Inches.
Seeding rains (April-May)	2.93	2.79	—	—
Winter rains (June-July)	7.05	4.70	—	—
Spring rains (August-October)	7.97	6.07	—	—
Early summer rains (November)	0.28	1.07	—	—
	18.23	14.82	—	—

CROPS.

The continuous rains during May and June made seeding operations extremely difficult, and a considerable amount of the wheat sown was drilled under boggy conditions, and weeds could not be killed.

Ensilage Crop.—Field No. 14, which was fallowed in 1921, and carried a wheat crop in 1922, was cultivated during May 3rd and 4th, drilled from 5th to 7th with 80lbs. of Calcutta oats and 1ewt. of super per acre. This crop made fair growth, and the whole of the field, an area of 8.72 acres, was cut. Part of Field 15, an area of 5.62 acres, was also cut for ensilage, making a total of 14.34 acres, yielding 73 tons, averaging 5 tons 4ewts. 67lbs. per acre.

Hay Crops.—The area devoted to cereals for hay was 76.07 acres. Some stubble land was sown with oats. Field 15 was sown with Calcutta oats, seeded at the rate of 80lbs. and 1ewt. of super per acre. Field 7 was sown with Calcutta oats, seeded at the rate of 80lbs. and 1ewt. of super per acre. Field 4 was sown with 75lbs. of Crossbred 53 and 2ewts. of super per acre on fallow land. Part of Field 23, was sown with various wheats at the rate of 75lbs. and 2ewts. of super per acre on fallow land, and was also cut for hay. The yields of hay obtained from the various fields are set out in the next table:

Hay Yields, Booborowie, 1923.

Kind.	Field Grown. No.	Area. Ares.	Total Yield.			Yield per Acre.
			T.	C.	I.	
Wheat crop	2 & 3	10.28	45	0	0	4 7 61
Wheat crop	4	16.66	57	0	0	3 8 48
Calcutta oats	7	9.3	45	0	0	4 12 29
Calcutta oats	15	6.67	30	10	0	1 11 54
Wheat headlands	11	2.64	6	0	0	2 5 51
Wheat crop	23	27.96	75	0	0	2 17 85
Wheat headlands	Exp. plots	2.28	7	0	0	2 0 52
Wheat headlands	27	1.18				
Farm average		76.07	215	10	0	2 16 74

The yields obtained must be considered good, although crops grown under such favorable conditions could hardly be otherwise.

Hay Returns, Booborowie, 1912-1923.

Year	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Ares.	Total Yield.			Yield per Acre.
				T.	C.	I.	
1912	15.50	13.20	70.00	132	5	0	1 18 88
1913	15.07	10.88	76.00	109	14	0	1 8 97
1914	9.76	7.79	—	Failure			—
1915	17.14	15.95	52.27	144	15	0	2 15 43
1916	22.41	20.28	37.93	109	14	0	2 17 94
1917	26.70	21.02	58.43	198	19	0	3 8 11
1918	13.87	11.98	51.41	107	0	0	2 1 70
1919	18.39	13.77	75.75	117	0	0	1 10 100
1920	22.22	19.57	75.64	225	0	0	2 19 55
1921	20.50	15.46	17.41	98	0	0	2 1 38
1922	20.32	15.61	88.38	168	0	0	1 18 2
1923	21.17	18.23	76.07	215	10	0	2 16 74
Means	18.59	15.31	—				2 3 9

Oat Crops.—Only a small area was devoted to oats for grain, and all oats were sown on stubble land. Field 24 was fallowed in 1921, and carried a wheat crop in 1922; was sown early in May with Scotch Grey and Algerian oats at the rate of 80lbs. and 1ewt. of super per acre. Field 9b was fallowed in 1921, and carried a wheat crop in

1922, and was sown with Caleutta oats early in May at the rate of 80lbs. seed and 1ewt. super per acre. The yields received from the oats crops are shown in the table below, with the total and average return for the season:—

Oat Yields, Booborowie, 1923.

Variety.	Field Grown	Area, Acres.	Total Yield, Bush. lbs.	Yield per Acre, Bush. lbs.
Scotch Grey	No. 24	10.04	270 9	26 37
Algerian	No. 24	5.9	125 7	21 9
Scotch Grey	Exp. plots	3.17	116 30	36 33
Caleutta	No. 9A	5.19	142 38	27 32
Farm average		—	24.30	655 4
				26 38

Oat Returns, Booborowie, 1913-1923.

Year.	Total Rainfall, In.	"Useful" Rainfall, In.	Area, Acres.	Total Yield, Bush. lbs.	Yield per Acre, Bush. lbs.
1913	15.07	10.86	54.00	1,394 13	32 11
1914	9.76	7.79	—	Failure	—
1915	17.14	15.95	75.47	2,410 20	31 38
1916	22.41	20.28	4.23	138 33	32 33
1917	26.70	21.02	4.68	231 25	49 26
1918	13.87	11.98	31.93	863 27	27 27
1919	18.39	13.77	22.40	451 18	20 7
1920	22.22	19.57	19.24	843 20	43 34
1921	20.50	15.46	18.72	445 19	23 22
1922	20.32	15.61	22.89	579 6	25 11
1923	21.17	18.23	24.30	655 4	26 38
Means	18.87	15.50	—	—	28 29

Only two varieties of oats have been grown continuously for the past few years, and the yields secured since 1916 are set out in the next table:—

Oat Varieties, Booborowie, 1916-1923.

Year.	Total Rainfall, In.	"Useful" Rainfall, In.	Scotch Grey, Bush. lbs.	Caleutta, Bush. lbs.	Farm Average, Bush. lbs.
1916	22.41	20.28	49 21	28 20	32 33
1917	26.70	21.02	61 20	44 29	49 26
1918	13.87	11.98	33 19	27 8	27 27
1919	18.39	13.77	22 24	21 5	20 6
1920	22.22	19.57	42 30	46 16	43 34
1921	20.50	15.46	32 8	19 8	23 22
1922	20.32	15.61	28 9	23 4	25 12
1923	21.17	18.23	29 12	27 22	26 38
Mears	20.70	16.99	37 18	29 29	31 27

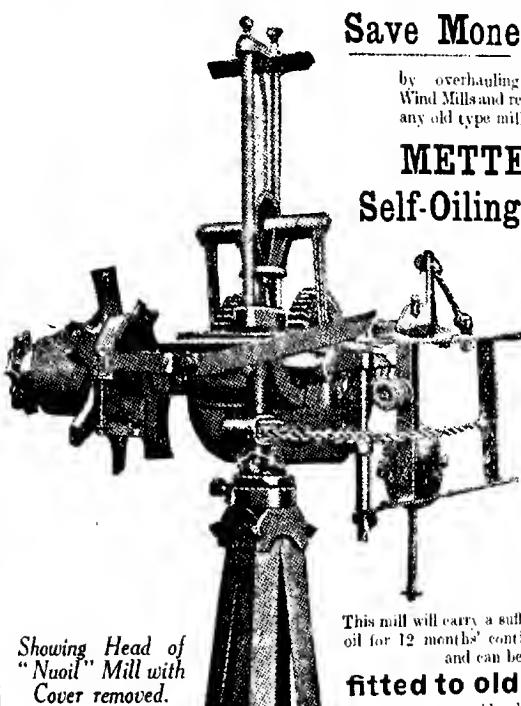
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Barley Crops.—All barley was sown on stubble land at the rate of 60lbs. of seed and 1ewt. of super per acre. Field 24 was cultivated and sown during the last half of June. Details of this year's barley crops are shown in the next table:—

Barley Yields, Booborowie, 1923.

Variety.	Field Grown.	Area	Total Yield.	Yield	
				Acres.	Bush. lbs.
Short Head	No. 24	32.11	580 42		18 4
Roseworthy Oregon	Exp. plots	2.89	30 35		10 31
<hr/>			<hr/>		
Farm average		35.00	611 27		17 29

The barley in Field 24 went down so badly that 1 estimate we only obtained about one-half of the grain. Apart from the crop going down, the heads broke at the first node, making it impossible to get the grain with a reaper thresher, even with every alternate tooth out.

One of the rotation plots, with an area of 1.5553 acres, sown with barley No. 36, yielded only 3bush. 17lbs. per acre, having been almost completely destroyed by dandelions.

Barley Returns, Booborowie, 1915-1923.

Year.	Total Rainfall.	"Useful" Rainfall.	Area.	Total Yield.	Yield	
					in.	in.
1915	17.14	15.95	3.09	108 26	35 6	
1916	22.41	20.28	35.93	1,119 46	31 8	
1917	26.70	21.02	23.65	914 26	33 32	
1918	13.87	11.98	29.11	1,045 23	35 46	
1919	18.39	13.77	32.58	501 1	15 19	
1920	22.22	19.57	35.39	1,087 38	30 37	
1921	20.50	15.46	52.52	1,454 5	27 34	
1922	20.32	15.01	38.53	1,014 35	26 17	
1923	21.17	18.23	35.00	611 27	17 29	
Means	20.30	16.87	—	—	28 36	

Wheat Crops.—As usual, an assortment of wheat varieties was grown this season. The table setting out the yields of the different kinds shows that the best crop produced a yield of 39bush. 12lbs. per acre, whereas the poorest did not yield higher than 16bush. 29lbs. per acre. Testing varieties is essentially one of the operations of an experimental farm, but it has the inevitable effect of reducing the wheat yields considerably below those that could be expected with only the highest yielding varieties grown. All wheat crops were

grown on fallowed land, and the fields which carried these crops were treated as follows:—

Field 23.—This field carried oats and barley in 1920, and barley in 1921. It was fallowed between the 13th and 14th of August, 1922, rolled, harrowed, and cultivated from September 20th to 25th, cultivated and drilled in between June 7th and 20th with 75lbs. of seed and 2ewts. super per acre.

Field 27.—This field carried a crop of barley in 1920, was pastured during 1921, and fallowed in 1922 between July 3rd and 14th. It was cultivated between 2nd and 3rd of October, cultivated and drilled from May 25th to 28th with 75lbs. seed and 2ewts. super per acre.

Field 4.—This field was pastured during 1921, fallowed between August 24th and 29th, 1922, harrowed September 9th, cultivated October 9th to 12th, cultivated and drilled from May 19th to 25th with 75lbs. seed and 2ewts. super per acre.

Field 11.—This field was sown for pasture during 1921, was fallowed from August 29th to September 2nd, 1922, harrowed on the 5th September, cultivated and drilled from June 21st to 22nd with 75lbs. seed and 2ewts. super per acre.

Wheat Variety Yields, Booroorawie, 1923.

Variety.	Field Grown.	Area Acres.	Total Yield, Bush. lbs.	Yield per Acre, Bush. lbs.
Yandilla King	23	2.29	89 47	39 12
Federation	4	2.00	74 30	37 15
Federation	Exp. plots	34.00	1,148 59	33 18
Marshall's No. 3	23	2.38	79 9	33 12
Federation	Exp. plot	22.65	740 30	32 12
Caliph	23	2.14	67 13	31 25
Major	27	16.27	502 49	30 54
Major	11	1.81	54 18	30 0
Onas	23	2.84	83 40	29 28
Hard Federation	23	3.52	101 33	28 51
King's White	23	2.19	62 25	28 30
Currawa	23	1.65	45 28	27 33
Queen Fan	23	2.21	60 45	27 29
Yandilla King	11	2.03	54 27	26 49
Queen Fan	11	1.65	43 54	26 36
Leak's Rustproof	23	0.70	18 25	26 19
Glycas	11	4.04	98 38	23 25
Marshall's No. 3	11	1.59	37 35	23 38
Crossbred 53	11	1.74	28 41	16 29
Farm average		107.70	3,392 37	31 30

The average wheat yield of 31bush. 30lbs. per acre must be considered good when low-yielding varieties are grown along with heavy-yielding varieties.

Wheat Returns, Booborowie, 1912-1923.

Year.	Total Rainfall.		"Useful"		Total Yield, Bush. lbs.	Yield per Acre, Bush. lbs.
	In.	In.	Area, Acres.	Bush. lbs.		
1912	15.50	13.20	180.00	4,645 20	25 42	
1913	15.07	10.86	388.75	6,611 53	17 0	
1914	9.76	7.79	339.75	990 58	2 55	
1915	17.14	15.95	284.28	7,765 2	27 19	
1916	22.41	20.23	216.67	7,668 40	35 24	
1917	26.70	21.02	153.22	4,984 30	32 32	
1918	13.87	11.98	173.81	4,631 32	26 39	
1919	18.39	13.77	113.84	3,041 15	26 43	
1920	22.22	19.57	91.51	2,937 17	32 5	
1921	20.50	15.46	103.10	2,112 32	20 29	
1922	20.32	15.61	66.85	1,840 13	27 32	
1923	21.17	18.23	107.70	3,392 37	31 39	
Means	18.59	15.31	—	—	25 30	

The average yield of 25bush. 30lbs. per acre for the 12-year period, 1912 to 1923, is very satisfactory considering 1914 approached a failure, and that a number of varieties that are not suitable to the district have to be grown. Judging on the basis of the above figures, it can be taken that with an application of 2ewts. of super on well-worked fallowed land, the average annual yielding capacity of this neighborhood, when suitable varieties are grown, is in the vicinity of 30bush. per acre.

Yields of Wheat Varieties, Booborowie, 1916-1923.

Means, 1916- 1918.	1919.						Means, 1919- 1923.	
	B. L.		B. L.		B. L.			
	B.	L.	B.	L.	B.	L.		
Major	—	31 47	46 14	28 9	29 48	30 49	33 21	
Federation	36 26	26 29	31 12	19 1	27 45	33 29	27 39	
Leak's Rustproof	*24 0	29 39	29 4	23 25	15 40	26 19	24 49	
Crossbred 53	*25 8	21 9	28 59	17 21	23 0	16 29	21 24	
Onas	35 40	24 52	38 23	25 41	—	29 28		
Yandilla King	32 24	30 28	41 8	25 59	—	33 23		
Queen Fan	29 51	24 6	35 13	21 9	—	27 7		
Caliph	24 48	31 14	33 27	25 53	—	31 25		
Marshall's No. 3	29 9	29 26	33 38	13 10	—	29 22		
Glynn	24 57	31 15	31 58	21 44	—	24 45		
King's Red	24 45	23 53	35 15	22 57	—	27 33		
Minister	*34 6	26 54	34 38	22 26	—	28 51		
King's White	—	—	—	—	—	28 30		

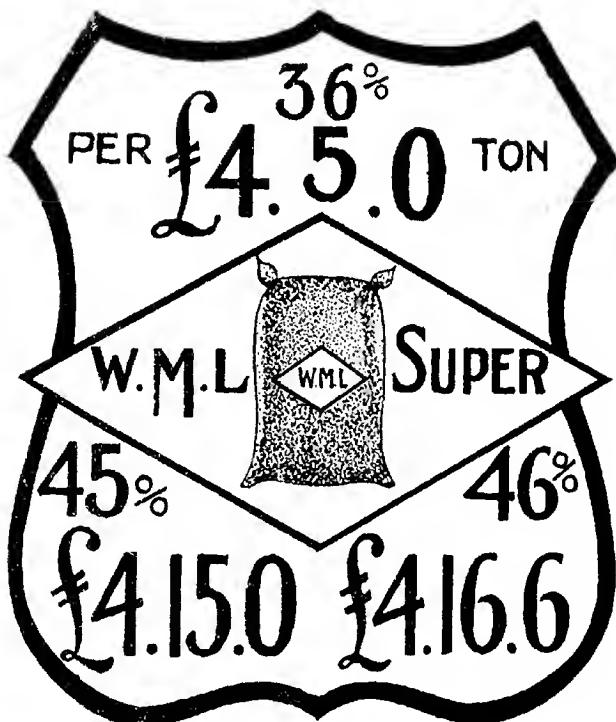
*1918 only.

PERMANENT EXPERIMENTAL PLOTS.

Instead of placing experimental plots in different fields each year, the policy of permanent plots has been adopted, with the idea of eliminating residual effects of fertilisers.

BARE FALLOW-WHEAT EXPERIMENTS.

Various series of permanent experiments dealing with wheat in bare fallow-wheat rotation, and covering manurial, cultivation, and depth of ploughing tests were mapped out in 1915. The plots carried their first crops in 1916. The plots are so arranged that one-half of each is fallowed every alternate year, the half fallowed one year carrying a crop the following year, and *vice versa*. For the eight years that these plots have been cropped, Federation wheat has been used on all plots.



Permanent Manurial Plots, Booborowie, 1916-1923.

Plot.

1. $\frac{1}{2}$ ewt. superphosphate.
2. 1ewt. superphosphate.
3. 2ewts. superphosphate.
4. 3ewts. superphosphate.
5. No manure.
6. 1ewt. super, $\frac{1}{2}$ ewt. nitrate of soda (spring).
7. 2ewts. super, $\frac{1}{2}$ ewt. nitrate of soda (spring).
8. 1ewt. super, $\frac{1}{2}$ ewt. sulphate of ammonia (seeding).
9. 2ewts. super, $\frac{1}{2}$ ewt. sulphate of ammonia (seeding).
10. 1ewt. super, $\frac{1}{2}$ ewt. muriate of potash (seeding).
11. 2ewts. super, $\frac{1}{2}$ ewt. muriate of potash (seeding).
12. 2ewts. super, $\frac{1}{2}$ ewt. muriate of potash (seeding), $\frac{1}{2}$ ewt. nitrate of soda (spring).
13. 1ewt. superphosphate.
14. No manure.
15. 1ewt. basic slag.
16. 2ewts. basic slag.
17. 10 tons farmyard manure.
18. 10 tons farmyard manure, 2ewts. super.
19. 10 tons farmyard manure, 2ewts. super, $\frac{1}{2}$ ewt. muriate of potash.
20. 2ewts. super, 4ewts. gypsum.
21. 2ewts. super, 5ewts. lime.
22. 2ewts. super (half at ploughing).
23. 2ewts. super (half at ploughing), $\frac{1}{2}$ ewt. nitrate of soda (spring).

75lbs. of Federation seed used per acre on all plots.

Plot.	Yield per Acre.						Mean.
	1916.	1917.	1918.	1919.	1920.	1921.	
1	36 58	29 23	23 28	26 50	30 11	11 52	23 25
2	38 57	28 14	34 27	29 3	29 52	13 45	27 34
3	39 3	30 5	40 50	23 16	28 31	19 40	32 29
4	38 0	29 20	41 4	30 39	32 6	18 39	35 11
5	32 58	27 39	24 24	17 32	23 29	5 25	13 11
6	40 18	34 50	35 38	27 34	32 56	18 17	26 45
7	40 50	34 36	36 33	31 35	32 5	19 14	26 2
8	41 25	31 18	32 33	28 53	33 39	17 22	28 45
9	38 11	36 13	34 28	29 33	30 48	21 21	26 25
10	40 50	32 31	34 44	28 9	28 44	12 13	26 31
11	44 1	30 54	34 41	29 0	29 20	19 26	28 10
12	40 34	34 28	36 31	29 7	30 8	19 58	30 42
13	40 11	34 55	34 18	25 58	29 36	17 6	28 57
14	40 9	28 31	24 36	14 6	21 9	3 9	12 53
15	41 55	34 14	28 49	22 26	28 30	21 47	24 30
16	42 23	39 43	28 10	27 47	29 22	21 46	24 19
17	40 7	31 26	28 25	28 8	29 49	12 5	26 10
18	41 44	32 41	32 40	32 17	28 43	21 0	27 37
19	42 5	31 56	32 0	32 12	33 34	20 16	27 42
20	41 8	31 36	33 12	29 13	28 43	20 29	29 25
21	45 58	35 38	31 3	29 36	29 15	19 51	29 52
22	40 40	32 18	30 16	28 52	28 59	18 44	27 35
23	41 31	32 20	31 55	28 3	31 20	18 0	28 37

These manurial tests with wheat have been conducted continuously the past six seasons, and in such a series of seasons and in these particular soil conditions, they appear to indicate that:—

1.—A $\frac{1}{2}$ ewt. dressing of superphosphate gives an increase of 4bush. 54lbs. of wheat per acre over and above the yield received from wheat grown without manure.

2.—A dressing of 1ewt. of superphosphate gives an increased yield of 8bush. 25lbs. per acre.

3.—A 2ewts. dressing of superphosphate gives an increase of 10bush. 10lbs. per acre.

4.—A 3ewts. dressing of superphosphate gives an increase of 11bush. 5lbs. per acre.

5.—A dressing of 1ewt. superphosphate gives an increase of 3bush. 31lbs. over and above that received from a $\frac{1}{2}$ ewt. dressing of superphosphate.

6.—A dressing of 2ewts. of superphosphate gives an increase of 3bush. 16lbs. over a $\frac{1}{2}$ ewt. dressing.

7.—A dressing of 3ewts. of superphosphate gives an increase of 6bush. 11lbs. over a $\frac{1}{2}$ ewt. dressing.

8.—A dressing of 2ewts. superphosphate gives an increase of 3bush. 45lbs. over and above that received from a dressing of 1ewt. superphosphate.

9.—A dressing of 3ewts. superphosphate gives an increase of 2bush. 40lbs. over a 1ewt. application.

10.—A 3ewts. dressing of superphosphate gives an increase of 35lbs. over and above that received from a 2ewts. application of superphosphate.

11.—An application of 1ewt. basic slag gives an increase of 8bush. 16lbs. over the no-manure plots.

12.—An application of 2ewts. basic slag gives an increase of 9bush. 32lbs. over the no-manure plots.

13.—A dressing of 2ewts. basic slag gives an increase of 1bush. 16lbs. over a 1ewt. application of basic slag.

14.—The addition of $\frac{1}{2}$ ewt. nitrate of soda to a dressing of 1ewt. superphosphate gives an increase of 1bush. 35lbs. per acre.

15.—The addition of $\frac{1}{2}$ ewt. of nitrate of soda to a dressing of 2ewts. superphosphate gives an increase of 7lbs. per acre.

16.—An application of $\frac{1}{2}$ ewt. sulphate of ammonia added to 1ewt. of superphosphate gives an increase of 1bush. 13lbs. per acre.

17.—An application of $\frac{1}{2}$ ewt. sulphate of ammonia added to a 2ewts. dressing of superphosphate results in a loss of 17lbs. per acre.

18.—A $\frac{1}{2}$ ewt. dressing of muriate of potash in addition to 1ewt. superphosphate results in a loss of 9lbs. per acre.

19.—A $\frac{1}{2}$ ewt. dressing of muriate of potash in addition to 2ewts. superphosphate results in a loss of 38lbs. per acre.

20.—The addition of $\frac{1}{2}$ ewt. muriate of potash and $\frac{1}{2}$ ewt. nitrate of soda to 2ewts. superphosphate gives an increase of 22lbs. per acre. The addition of $\frac{1}{2}$ ewt. muriate of potash gives an increase of 15lbs.

over the superphosphate and nitrate of soda. The addition of $\frac{1}{2}$ ewt. nitrate of soda gives an increase of 1bush. over the superphosphate and muriate of potash dressing.

21.—Ten tons of farmyard manure per acre gives an increase of 7bush. 34lbs. of wheat over no-manure, at a minimum cost of £4 for the fertiliser.

22.—Ten tons of farmyard manure and 2ewts. superphosphate per acre gives a yield of 9lbs. of wheat less than that received from a dressing of 2ewts. superphosphate alone. The addition of $\frac{1}{2}$ ewt. muriate of potash to 2ewts. superphosphate and 10 tons farmyard manure only gives an increase of 28lbs. per acre.

23.—The addition of 4ewts. of gypsum to the dressing of 2ewts. of superphosphate results in a loss of 1bush. 6lbs. of wheat per acre.

24.—The addition of 5ewts. of lime to a dressing of 2ewts. superphosphate results in a loss of 4lbs. per acre at a minimum extra cost of 8s. for lime.

25.—Putting half of the superphosphate into the land at ploughing time, and at the depth of ploughing, does not give an increase over the method of putting all of the superphosphate in with the seed, when 2ewts. of superphosphate is used to the acre.

26.—The addition of $\frac{1}{2}$ ewt. of nitrate of soda to 2ewts. of superphosphate, when half the latter fertiliser is put in the soil at ploughing time only gives an increase of 46lbs. per acre.

MONEY VALUE OF INCREASE.

Owing to the varying prices of both grain and fertilisers, it is quite impossible to put a correct value on the increases obtained from the different fertilisers, but if we take figures about 25 per cent. in advance of pre-war prices, we can compare the results as shown below. In the following table the prices used to arrive at the values of grain increases are:—

	s. d.
Wheat	3 9 per bush.
Superphosphate	5 0 per ewt.
Basic slag	5 0 per ewt.
Nitrate of soda	18 0 per ewt.
Sulphate of ammonia	16 0 per ewt.
Muriate of potash	18 0 per ewt.
Farmyard manure	8 0 per ton
Gypsum	2 0 per ewt.
Lime	32 0 per ton

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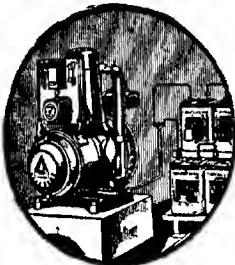
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MONEY VALUE OF INCREASE—continued.

Addition of—	To—	Gives Increase of—	Increase at 3s. 9d. per Bush.	Cost of Extra Outlay.	Per Acre
½cwt. super.	No manure	4 54	18 5	2 6	15
1cwt. super.	No manure	8 25	31 7	5 0	26
2cwt. super.	No manure	10 10	38 2	10 0	38
3cwt. super.	No manure	11 5	41 7	15 0	36
½cwt. super.	½cwt. super.	3 31	13 2	2 6	10
1½cwt. super.	½cwt. super.	5 16	19 9	7 6	12
2½cwt. super.	½cwt. super.	6 11	23 2	12 6	16
1cwt. super.	lewt. super.	1 45	6 7	5 0	1
2cwt. super.	lewt. super.	2 40	10 0	10 0	-
lewt. super.	2cwt. super.	0 55	3 5	5 0	L
1cwt. basic slag	No manure	8 16	31 0	5 0	36
2cwt. basic slag	No manure	9 32	35 9	10 0	33
1cwt. basic slag	lewt. basic slag	1 16	4 9	5 0	L
½cwt. nitrate of soda	lewt. super.	1 35	5 11	9 0	L
½cwt. nitrate of soda	2cwt. super.	0 7	0 5	9 0	L
½cwt. sulphate of ammonia	lewt. super.	1 13	4 7	8 0	L
½cwt. sulphate of ammonia	2cwt. super.	*—	—	8 0	L
½cwt. muriate of potash ..	lewt. super.	*—	—	9 0	L
½cwt. muriate of potash ..	2cwt. super.	*—	—	9 0	L
½cwt. muriate of potash and ½cwt. nitrate of soda ..	2cwt. super.	0 22	1 5	18 0	L
½cwt. muriate of potash ..	2cwt. super. and ½cwt. nitrate of soda	0 15	0 11	9 0	L
½cwt. nitrate of soda	2cwt. super. and ½cwt. muriate of potash	1 0	3 9	9 0	L
10 tons farmyard manure.	No manure	7 34	28 5	80 0	L
10 tons farmyard manure.	2cwt. super.	3—	—	80 0	L
½cwt. muriate of potash ..	10 tons farmyard manure and 2cwt. super.	0 28	1 9	9 0	L
4cwt. gypsum	2cwt. super.	*—	—	8 0	L
5cwt. lime	2cwt. super.	*—	—	8 0	L

* 17lbs. decrease.

† 9lbs. decrease.

‡ 38lbs. decrease.

§ 9lbs. decrease.

|| 1bush. 6lbs. decrease.

¶ 4lbs. decrease.

Permanent Cultivation Plots, Booborowie, 1916-1923.

All plots dressed with 2cwt. superphosphate per acre.

Plot.

Treatment.

Early Fallow (July)—

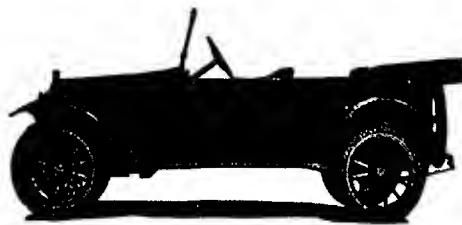
24. Ploughed 6in., harrowed immediately. Cultivated or harrowed whenever necessary.
25. Ploughed 6in., left untouched during winter. Cultivated or harrowed whenever necessary.
26. Ploughed 6in., rolled immediately. Cultivated or harrowed whenever necessary.
27. Ploughed 6in., skim ploughed after rain. Cultivated or harrowed whenever necessary.

Late fallow (after September 1st)—

28. Ploughed 3in. Cultivated or harrowed whenever necessary; not rolled.
29. Ploughed 6in. Rolled same day as ploughed. Cultivated according to requirements.

Autumn Ploughing—

30. Ploughed 4in. at seeding, not fallowed, and immediately rolled.



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Permanent Cultivation Plots, Booborowie, 1916-1923—continued.

Plot.	Yield per Acre.							Means, 1916-23.
	1916. B. L.	1917. B. L.	1918. B. L.	1919. B. L.	1920. B. L.	1921. B. L.	1922. B. L.	
24 . . .	40 48	31 33	31 44	28 30	30 29	19 14	28 25	34 26
25 . . .	41 4	35 52	33 56	28 45	29 19	19 30	30 9	34 0
26 . . .	33 25	33 14	29 34	27 31	28 26	20 40	27 43	34 8
27 . . .	41 1	33 47	32 24	25 53	27 57	19 27	29 34	32 48
28 . . .	35 38	32 29	31 28	26 35	29 6	17 15	22 18	31 0
29 . . .	37 45	30 56	31 25	26 39	28 46	16 34	24 53	29 57
30 . . .	35 49	24 3	28 12	17 58	26 30	9 29	18 45	22 35

Permanent Depth of Ploughing Plots, Booborowie, 1916-1923.

All plots dressed with 2ewts. superphosphate per acre.

Plot. Depth of Ploughing.

31. Ploughed 3in. deep.

32. Ploughed 6in. deep.

33. Ploughed 9in. deep.

34. Ploughed 9in. deep. To be then twice ploughed 3in. deep before again ploughing 9in. deep.

Plot.	Yield per Acre.							Means, 1916-23.
	1916. B. L.	1917. B. L.	1918. B. L.	1919. B. L.	1920. B. L.	1921. B. L.	1922. B. L.	
31 . . .	39 51	28 20	33 38	27 25	28 23	19 56	26 22	31 7
32 . . .	37 13	31 24	32 42	27 1	28 50	21 24	28 44	34 2
33 . . .	33 54	33 17	32 23	27 20	29 19	20 44	27 38	35 45
34 . . .	33 44*	—	30 35†	—	29 34†	—	24 4*	—
	—	32 13*	—	27 36†	—	20 44†	—	*37 24}

* 9in. ploughing. † 3in. ploughing.

The tests, comparing different methods of cultivating land for wheat growing, show that where the same variety of wheat is grown and the same manuring practised at Booborowie, for a series of seasons, such as the past eight:—

1. Bare fallowing the land early or late, and any subsequent method of cultivation, increases the yield above non-fallow to the extent of from 3bush. 20lbs. to 8bush. 39lbs. per acre.

2. The biggest returns are obtained from fallowed land prepared according to the recognised practice of the district, *i.e.*, ploughing early (July), leaving rough throughout the winter, then cultivating or harrowing whenever weeds or a surface crust render it necessary.

3. Harrowing the land immediately after ploughing appears to have a depressing effect to the extent of about 1bush. per acre in the yield.

4. Rolling immediately after early ploughing (July) appears to have a depressing effect on the yield to the extent of, approximately, 2bush. per acre.

5. Skim ploughing the fallowed land after the first rain does not increase the yield received from ordinary fallow treatment.

6. Land ploughed in July in preparing the bare fallow gives an increase of 3bush. 20lbs. per acre over the yield received from land ploughed in September.

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7. September ploughing gives about equal yields whether ploughed shallow (3in.) and not rolled or ploughed deep (6in.) and heavily rolled the same day.

8. The depth to which land is ploughed between 3in. and 9in. has had but little effect on the yields of wheat crops in this locality up till the present.

ROTATION OF CROPS.—EXPERIMENTAL PLOTS.

Several series of permanent experimental plots were planned in 1915, and all of these have been continued since that time. The field chosen for the rotation plots was, fortunately, bare fallowed in 1914, so that the crops and records for these crops commence from that year.

Rotation Plots, Booborowie, 1915-1923.

	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1915-23	Means.									
	B.	L.	B.																	
SERIES I.—Plots 1 and 2.																				
<i>Bare fallow—Wheat (2cwt. super).</i>																				
Wheat .	29	42	30	28	32	22	23	10	23	5	28	9	24	0	30	29	32	38	28	31
SERIES II.—Plots 3 and 4.																				
<i>Sorghum—Wheat (2cwt. super).</i>																				
Wheat .	34	44	31	20	31	50	19	49	24	37	31	50	16	37	30	8	28	41	27	44
SERIES IIIA.—Plots 5 to 7.																				
<i>Pasture—Bare fallow—Wheat (no manure).</i>																				
Wheat .	29	5	28	45	25	40	15	40	20	6	22	17	16	44	16	56	18	53	21	34
SERIES IIIB.—Plots 8 to 10.																				
<i>Pasture—Bare fallow—Wheat (1cwt. super).</i>																				
Wheat .	37	9	37	47	35	10	26	5	29	53	35	54	23	14	33	18	33	24	32	36
SERIES IIIC.—Plots 11 to 13.																				
<i>Pasture—Bare fallow—Wheat (1cwt. super).</i>																				
Wheat .	38	51	39	17	36	6	27	56	28	28	35	51	22	36	38	24	33	1	33	25
SERIES IIID.—Plots 14 to 16.																				
<i>Pasture—Bare fallow—Wheat (2cwt. super).</i>																				
Wheat .	37	6	39	30	36	48	23	55	28	41	33	1	23	43	30	43	31	25	31	39
SERIES IIIE.—Plots 17 to 19.																				
<i>Pasture—Bare fallow—Wheat (3cwt. super).</i>																				
Wheat .	39	40	40	0	32	58	25	43	27	26	32	17	25	1	34	43	25	34	31	35
SERIES IV A.—Plots 20 to 22.																				
<i>Bare fallow—Wheat (2cwt. super)—Barley (1cwt. super).</i>																				
Wheat .	37	37	43	40	38	33	27	6	25	13	33	25	22	22	33	23	29	11	32	16
Barley .	27	48	26	27	18	5	27	17	1	18	20	13	15	45	29	43	19	3	20	35

Rotation Plots, Booroorwie, 1915-1923—continued.

										MEANS.	
1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1915-23.	B.	L.

SERIES IVB.—Plots 23 to 25.

Bare fallow—Wheat (2cwt. super)—Oats (1cwt. super).

Wheat	34	0	42	25	41	52	28	18	26	26	38	6
Oats	31	9	33	23	45	32	43	18	14	30	42	32

SERIES IVC.—Plots 26 to 28.

Bare fallow—Wheat (2cwt. super)—Peas (1cwt. super).

Wheat	36	24	42	41	39	37	24	2	28	39	37	24

SERIES IVD.—Plots 29 to 31.

Bare fallow—Wheat (2cwt. super)—Rape (1cwt. super).

Wheat	31	52	44	54	45	27	23	11	24	16	35	20

SERIES V.—Plots 32 to 33.

Bare fallow—Wheat (2cwt. super).

Wheat	34	52	44	47	38	44	29	31	22	18	33	40

SERIES VI.—Plots 34 to 37.

Pasture—Bare fallow—Wheat (2cwt. super)—Barley (2cwt. super).

Wheat	35	1	49	5	37	56	27	19	27	24	33	12
Barley	43	7	34	16	27	43	37	28	14	5	24	1

SERIES VIIB.—Plots 38 to 41.

Pasture—Bare fallow—Wheat (2cwt. super)—Oats (2cwt. super).

Wheat	35	49	48	42	39	25	28	54	28	11	36	57
Oats	40	20	23	5	43	24	41	3	12	13	38	27

SERIES VII.—Plots 42 to 46.

Bare fallow—Wheat (2cwt. super)—Lucerne—Lucerne—Lucerne.

Wheat	33	37	33	47	41	37	33	30	28	1	36	48

SERIES VIII.—Plots 47 to 50.

Bare fallow—Wheat (2cwt. super)—Rye grass—Rye grass.

Wheat	22	0	47	30	32	45	25	26	23	45	32	19

Seed Used on Rotation Plots, 1923.

Wheat—Federation	75lbs. per acre.
Barley—Roseworthy Oregon	50lbs. per acre.
Oats—Scotch Grey	80lbs. per acre.
Peas—Early Dun	100lbs. per acre.
Rape—Dwarf Essex	5lbs. per acre.
Lucerne—Hunter River	6lbs. per acre.
Rye Grass—Italian	9½lbs. per acre.
Sorghum—Sudan Grass	6lbs. per acre.

Grazing Crops in Rotation Plots.

	Sheep per acre.								Mean, 1917- 1923.
SERIES II.—	1917.	1918.	1919.	1920.	1921.	1922.	1923.		
Sorghum	2.90	2.13	5.43	4.59	3.68	3.17	2.57		3.50
SERIES IIIA.—									
Pasture after wheat without manure . .	0.89	0.57	2.61	4.21	3.90	2.23	3.45		2.50
SERIES IIIB.—									
Pasture after wheat with 1cwt. super . .	1.28	0.99	2.61	3.60	4.15	3.42	4.09		2.88
SERIES IIIC.—									
Pasture after wheat with 1cwt. super . .	0.85	1.29	2.09	3.60	5.47	3.42	4.09		2.97
SERIES IIID.—									
Pasture after wheat with 2cwt. super . .	1.55	0.99	2.46	3.79	5.31	3.65	4.09		3.12
SERIES IIIE.—									
Pasture after wheat with 3cwt. super . .	1.24	0.71	2.32	4.49	5.77	3.39	3.38		3.04
SERIES IVC.—									
Peas with 1cwt. super	2.15	1.59	2.14	5.39	5.74	2.57	2.85		3.20
SERIES IVB.—									
Rape with 1cwt. super	1.59	1.41	2.16	6.48	2.05	1.52	3.62		2.69
SERIES VIIA.—									
Pasture after barley with 2cwt. super . .	1.23	1.27	1.78	2.53	4.01	3.17	2.31		2.33
SERIES VIIB.—									
Pasture after oats with 2cwt. super . .	1.46	1.47	1.81	3.95	3.96	2.08	3.43		2.50
SERIES VII.—									
Lucerne sown with wheat and 2cwt. super, 1916 crop (Plot 42)	1.49	2.06	1.52	—	—	—	—		1.69
1917 crop (Plot 46)	—	1.05	1.23	5.80	—	—	—		2.71
1918 crop (Plot 45)	—	—	1.38	4.63	7.57	—	—		4.53
1919 crop (Plot 44)	—	—	—	3.09	4.46	3.15	—		3.57
1920 crop (Plot 43)	—	—	—	—	6.79	2.61	3.49		4.30
1921 crop (Plot 42)	—	—	—	—	—	2.09	3.49		—
1922 crop (Plot 46)	—	—	—	—	—	—	2.00		—
SERIES VIII.—									
Rye grass sown with wheat and 2cwt. super—	1917.	1918.	1919.	1920.	1921.	1922.	1923.	Means, two years period.	
1915 crop (Plot 48)	0.97	—	—	—	—	—	—		—
1916 crop (Plot 47)	2.20	1.30	—	—	—	—	—		1.75
1917 crop (Plot 50)	—	2.53	2.35	—	—	—	—		2.41
1918 crop (Plot 49)	—	—	1.77	6.29	—	—	—		4.03
1919 crop (Plot 48)	—	—	—	4.85	6.29	—	—		5.57
1920 crop (Plot 47)	—	—	—	—	4.80	3.19	—		4.0
1921 crop (Plot 50)	—	—	—	—	—	2.12	2.69		2.41
1922 crop (Plot 49)	—	—	—	—	—	—	4.20		—

CALF REARING.

[By P. H. SUTER, Dairy Expert.]

The feeding and rearing of dairy calves means much to the future success in dairying. Should the calves be denied sufficient nutrient, their future usefulness as producers is considerably impaired. On the other hand, it is a mistake to permit the calf intended for dairy purposes to run with its dam. Naturally the calf develops rapidly; but, unfortunately, such a system tends to promote beef tendencies rather than dairy qualities, and the cow's milking capabilities are spoilt. Far too many of the calves reared on the average farm are constitutionally ruined during the first fortnight of life; they are invariably weaned of milk too early.

The foremost consideration of the dairyman is to keep the calf in a good thrifty condition and prevent any possibility of its losing calf flesh. Any check in a calf's early life is detrimental to its future existence. We are quite familiar with such cases, brought about by wrong feeding or an animal loosing flesh due to scours. If calves are not kept growing well, it is impossible to build good producing cows from them. There is no other animal called upon to produce so much food yearly; consequently, calves should receive the care and attention necessary to fulfil these requirements.

TREATMENT OF Cows.

It is of the utmost importance that the cows should be kept in good condition and allowed at least from six to eight weeks rest from the time of drying off until calving. This rest given to the cow not only allows the cow a chance to recover from the drain upon her system during the milking season, but enables the calf to receive its full supply of nutrient, which it would be denied if the cows were low in condition, and if a shorter rest were given. It is a great mistake to allow cows to become low in condition just prior to calving. Probably the calf will not suffer so much; the ill-effects will lie in the drain upon the cow during her subsequent lactation period. The heavy drain upon the cow during her milking period must not be forgotten; a cow yielding 600galls. of milk with 4 per cent. butter fat produces not less than 780lbs. of solid matter yearly. This is considerably more than the total matter obtained in the weight of a four-year-old beef animal.

Providing the cow has ample feed, &c., very little attention is required, except probably that it is wise to give her a drench of $\frac{3}{4}$ lb. to 1lb. of salts with $\frac{1}{2}$ lb. treacle and $\frac{1}{2}$ oz. ground gentian, and 1oz. ginger in a couple of quarts of lukewarm water about twice during the two weeks preceding calving.

CALF AT BIRTH.

The best time to remove a calf from its mother is a matter of opinion. Personally, I favor 24 hours after birth, for by this time the calf has been licked dry by its mother, and is firmly established on its feet. Some favor leaving it longer, whereas others remove it immediately it

is dropped. There is no denying the fact that a calf derives benefit from remaining with its mother for two or three days; yet it is questionable if the benefit for the calf compensates for the fretting of the cow when the youngster is removed. The cow's maternal instincts have developed for its young, consequently trouble may be experienced in milking, due to her withdrawing the flow of milk. This is more noticeable with cows on their first calf. The calf removed at this stage is, as a rule, harder to teach to drink.

Immediately the calf is born it is wise to tie the naval cord 2 in. from the belly, with a piece of tape, which has been saturated in some disinfectant. Then cut the naval cord half an inch below the knot, and apply colognian Stockholm tar to it. This lessens the danger of introducing germs into the system.

FEEDING THE CALF.

In Nature, the calf gets its milk often, in small quantities, and at blood temperature, and it should be the aim of dairymen to imitate Nature as far as possible. The first milk secreted by the cow is termed "colostrum." Colostrum contains practically five times as much albumenoid matter and nearly twice as much mineral matter as does normal milk. Further, the albumenoid matter, instead of mainly being in the form of casein, is chiefly in the form of albumen (white of egg), and will not curdle in the calf's stomach. In the event of the death of the cow, probably the best substitute for its milk will consist of one egg beaten up to half a pint of water, half teaspoonful of castor oil, with one pint of whole milk stirred in for each meal. As a food substance, colostrum has a purgative effect on the youngster, cleaning the offensive matter from the intestines and leaving them in healthy working order. Generally, the milk reaches its normal condition after the fifth day, although occasionally eight to eleven will elapse before it has reached its normal stage. The proportion of solids in the milk during the first stages is very high.

If the calf is denied the first milk of its mother constiveness generally results, followed by diarrhoea. In some instances, where calves are removed from their mothers at birth, especially where two or more are born about the same time, the colostrum is pooled and fed to all the calves. If calves are fed on normal milk in the early stages of life the acid secretions on the lining membrane of the intestines cause the milk to coagulate and separate into two parts, the curd remaining as a foreign or irritating substance in the intestines and the fluid or whey passes off in the form of semi-fluid matter. This is the fore runner of scours in calves. It is imperative that the tender stomach of the calf should receive a food of a delicate nature.

WHOLE MILK FEEDING.

The youngster should receive whole milk for at least a fortnight and receive its daily allowance in three meals at a temperature of 90deg. F. At the end of the second week separated milk, free from froth, may be gradually added, until the ration is entirely of skim milk. Increase the amount of skim milk gradually. If the calves are being fed 12lbs. of whole milk per day, commence by giving 2lbs of skim milk to 10lbs. of whole milk, and so on until the end of a

fortnight, by which time the substitution has taken place. When skim milk is added to the ration, something must replace the fat extracted in the act of separation.

METHODS OF FEEDING.

For feeding calves, a rubber teat which has a tube attached has been extensively used. With the aid of this, the calf receives its food in a more natural way, and benefits by drinking slowly, thereby causing the saliva to mix more freely with the milk. This method certainly entails more labor and requires more attention to cleanl'ness of the teats and tubes, as well as extra attention at feeding time, for if the calf has drained the bucket of its milk, and the teat is not removed, the continual sucking by the calf from an empty bucket results in air being sucked into the stomach. For the purpose of feeding calves in this manner, it is necessary to have miniature bails, so that the calves may suck without interference from each other.

TIED-UP CALVES.

This method, followed by a good number of dairymen, has proved very successful when the calf has clean surroundings and good shed accommodation, and is permitted to have plenty of run. By feeding separately, the feeder is better able to adjust the amount required by each individual calf, and notice any symptoms of sickness. When any number are fed in this fashion, it means a lot of unnecessary trotting about and requires the presence of a feeder for each calf; otherwise the food is bound to be upset.

TRough FEEDING.

Probably this method is most commonly employed. Varying numbers of calves are fed at once. In most instances, little attention is paid to their size, &c., once the ration comprises skim milk, consequently it is a case of the stronger calf outclassing the weaker, and a race to feed as fast as possible, and it must be remembered that some calves drink more quickly than others.

It does not require much reasoning to determine that this method cannot possibly secure the same results as where calves are not bumped about, but are allowed to feed in peace.

SEPARATE BUCKETS AND MINIATURE BAiLS.

Probably no system of calf feeding answers so well as miniature bails. With these bails it is not necessary to have partitions. It is an advantage to have the top of each batten, which stands upright when the calf is bailed and falls outward in a slanting fashion, slightly longer than the stationary upright. On the top level portion of the bail is attached, by means of an iron pin, a piece of oregon 3in. x 1 $\frac{1}{2}$ in. This piece or oregon extends the full length of the bails, being run through a socket. When the bails are open to receive the head of the calf, the piece of oregon, being pinned to each slanting portion of the bail, projects from the upright at the end the length of one bail. To the timber running parallel to the top portion of the frame is attached a lever; thus, when the calves run into the feeding yard, and being eager for their feed, push their heads through the bails, the lever is

pulled, and the calves are all bailed at one operation. The starting portion pinned to the continuous batten can be operated independently of the lever; this being an advantage when one or more calves are required to be kept behind after feeding. In front of these bails, and instead of a continuous manger, is affixed a platform about 10in. wide and about 9in. to 12in. from the floor. On this platform is made a hole sufficiently large to hold the bucket for feeding purposes. Calves fed in this fashion, and allowed to remain bailed up for a short period after feeding, are less likely to contract the habit of sucking one another.

DISADVANTAGE OF SKIM MILK.

There is one disadvantage in feeding skim milk, as compared with allowing calves to sneak the cows. This appears, however, only when they are fed in a careless manner, as when they are only fed twice a day, especially in the first stages of life, and then allowed to have all the milk they will drink. They will, under these circumstances, develop into small, pot-bellied yearlings. Over-feeding is undoubtedly one of the most common causes of inferior calves. It is a mistake because the fat is removed from the milk, or because the calf is not doing well, to give it an extra allowance. Perhaps nothing upsets the digestive organs of the youngsters, especially when young, more quickly than milk fed at incorrect temperatures. The calf is very sensitive to temperature.

THE FIFTH WEEK AND ONWARDS.

At the end of the fourth week from birth the youngster should receive an allowance of crushed oats and bran and a small quantity of the best hay or chaff. It is preferable to break down the hardness of the chaff or hay by pouring hot water over it and allowing it to remain for 12 hours before feeding. Coarse food is too indigestible for young calves. Never allow any food to remain in the feeding trough. Should any be left, remove it and feed to the other stock. Food allowed to become semi-decayed often causes the death of the youngsters. After the animals have reached three months of age, they may be given milk that is slightly cooler, but care should be taken always to give it at the same temperature. If the calves are to be fully developed, they should be given milk for at least from four to five and a half months. After the fourth month the daily ration of milk may gradually be reduced, so that by the end of from five to five and a half months the milk is entirely omitted from the ration. At all times the calves should have abundance of pure drinking water.

Often undue loss of fat occurs in separating the milk, the dairyman perhaps being conscious of this leakage. He is, however, quite content to allow it, because he thinks the loss from this source is more than compensated for by the good results secured from it in feeding the calves. But butter fat is rather an expensive item to add to the diet when cheaper substitutes can be obtained. Probably nothing replaces the loss of fat in milk better than ground linseed cooked into porridge, it being highly digestible, and having beneficial effects upon the condition of the organs of digestion. In preparing the gruel or jelly, use 1lb. of linseed to 7lbs. of water. It is noticeable that calves

fed on linseed possess a sleek coat and thrifty appearance. Cod liver oil gives very good results; also copra cake. If serious scouring takes place amongst the calves, it is evident something is wrong with the ration. A dose of 1oz. to 2ozs. of castor oil, followed by 10 drops to 12 drops of laudanum in the afternoon generally corrects the trouble. A pint of linseed water given in the milk twice generally acts as a corrective. Very good results are also obtainable by using a teaspoonful of the following mixture:—15½ozs. of water to ½oz. of formalin. The exclusive feeding of skim milk for any length of time is not advisable. The composition of the food should resemble as near as possible whole milk in its nutritive ratio.

FEEDING WITH WHEY.

If cheese is made on the farm, or if the whey is pasteurised at the factory, it can generally be obtained in a fairly sweet condition. Unless pasteurised it should not be fed until at least one hour after being removed from the vat. At the end of this time most of the gas has disappeared. The amount of fat in whey is greater than in skim milk, but it is deficient in protein or curd. The curd is retained in the manufacture of cheese, yet most of the albumen, sugar, and mineral matter is retained in the whey.

It is always advisable to give the youngsters a start on milk diet for a few weeks before substituting whey. Commence by giving milk in the morning and whey in the afternoon. In a very short period they will readily take to it. Never mix whey and milk. Owing to the absence of nitrogenous matter, it is necessary to replace this element; ground oats and linseed jelly will fulfil this deficiency.

BOILED LINSEED.

The mode of preparing boiled linseed is:—Soak 2lbs. of ground linseed in 3galls. of water for 6 to 8 hours, and then boil for half an hour. Just before this is done, ¼lb. flour, previously made into a paste with cold water, is added. This is mixed at the rate of one part to four parts of milk. Whole linseed contains, roughly, 35 per cent. fat, 22 per cent. protein, whereas most of the meals have the fat extracted.

COD LIVER OIL.

Prorene the commercial bran of cod liver oil and give it to the calves during the second and fourth weeks at the rate of 1 dessert spoonful at each meal, and gradually increase the quantity until 2ozs. is given at each meal.

SUMMARY.

The following describes briefly the diet of the calf, although in respect of the quantities quoted it must be remembered that calves of different breeds require different amounts; likewise, individual calves of the same breed vary in their requirements:—

First week.—Its mother's milk three times daily, commencing on 9lbs. daily and increasing by the third day to 10lbs.

Second week.—12lbs. whole milk three times daily.

Third to fourth week.—Commence 2lbs. skim milk and 10lbs. whole milk, until the change from whole to skim has taken place; at the same time gradually increase the quantity to from 14lbs. to 15lbs.

together with one dessert spoonful to $1\frac{1}{2}$ dessert spoonfuls of cod liver oil, or 2ozs. of linseed porridge. Commence giving little crushed grain, &c.

Fifth to ninth week.—Milk, 6lbs. to 18lbs.: linseed, 1 pint; crushed oats, hay, or chaff, and grazing.

Tenth to sixteenth week.—18lbs. to 20lbs. milk; increase quantity of grain and chaff, &c.

Eighteenth to twentieth week.—Gradually wean of milk. Discontinue giving evening milk.

Twentieth to twenty-second week.—Discontinue milk altogether, but gradually and systematically increase the quantity of foods given.

RIVER MURRAY HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR FEBRUARY, 1924.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during February.	Per Cow during February.	Per Cow October to February.	Per Herd during February.	Per Cow during February.	Per Cow October to February.
1/O	34.03	32.31	25,585	751.83	4,114.74	919.89	27.91	153.73
1/J	20	16.31	8,439.5	421.98	2,429.73	397.42	19.87	109.20
1/L	20	18.52	10,295	515.77	3,269.77	468.60	23.48	141.79
1/M	22	18.52	9,043	411.04	2,015.60	478.77	21.76	165.60
1/R	18	17.48	6,565.5	364.75	2,626.37	348.96	19.39	124.00
1/T	15	10.31	6,938	462.53	2,415.91	333.49	22.23	126.92
1/W	17.90	14.14	6,249.5	349.13	2,512.56	243.95	13.63	96.66
1/Y	19	16.69	10,653.5	500.71	3,069.99	482.53	24.34	139.65
1/Z	20.66	18.52	9,746	471.73	2,648.44	429.53	20.70	120.35
1/D ₀	28.07	21.07	11,840	454.16	2,908.02	496.66	19.05	126.73
1/E ₂	11	10.55	6,661	605.55	3,216.20	296.27	26.93	147.44
1/F ₂	12	10.24	5,472	456.00	3,413.96	247.92	20.66	112.68
1/G ₂	12	10.38	6,101.5	508.46	3,468.86	267.76	22.31	156.48
1/H ₂	13	11.41	8,331.6	640.88	3,564.62	389.29	29.95	155.68
1/I ₂	13	10.38	6,501.5	500.11	3,032.76	304.48	23.42	131.88
1/J ₂	15	12.66	8,588.5	572.57	2,701.54	361.74	24.12	115.90
1/K ₂	14	12	8,279.5	591.39	3,196.31	359.07	25.65	139.66
1/L ₂	15.1	13.1	8,732	578.27	2,864.98	377.44	25.00	126.63
1/M ₂	19.86	18.28	9,890	497.98	2,949.70	487.98	24.57	139.55
Means	17.77	15.41	9,153.29	515.11	2,959.82	405.36	22.81	129.35

GLENCOE HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1924.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during March.	Per Cow during March.	Per Cow October to March.	Per Herd during March.	Per Cow during March.	Per Cow October to March.
J A	17	16.97	Lbs. 11269.5	Lbs. 662.91	Lbs. 4923.48	Lbs. 505.48	Lbs. 29.73	Lbs. 205.09
J B	16	15.61	5625	351.56	2371.02	298.17	18.64	104.83
J C	12	9.19	4817.5	401.46	4326.60	208.17	17.35	171.85
J D	11	9	7300.5	663.68	3514.53	279.81	25.44	134.75
J E	15	11.32	8427.5	561.83	3700.13	374.43	24.96	155.37
J F	9	8	3952.5	439.18	3892.42	192.62	21.40	157.86
J G	10.58	9.87	6261	591.77	4275.97	241.86	22.86	160.25
J H	16	15.23	7589	474.31	3535.30	332.64	20.79	136.23
J I	14	14	6603	471.64	3591.65	304.59	21.76	150.06
J J	15	15	5921	394.73	2557.24	291.31	19.42	115.21
J K	21.84	21.23	10848	496.70	3574.59	499.43	22.87	150.24
J L	21	19.68	7875	375.00	3225.96	373.97	17.81	131.98
J M	15.29	13.10	6124.5	388.84	3218.61	275.50	17.49	138.16
J N	20	17.13	10562.5	528.13	3332.74	514.87	25.74	142.04
J O	17	15	8897	523.35	3253.45	350.54	20.62	118.38
J P	61.29	59.77	20116.5	426.11	3380.97	1090.72	17.80	137.63
J R	18	18	11361.5	631.19	4184.22	510.04	28.34	178.94
Means	18.24	16.94	8797.14	482.42	3529.22	300.83	21.43	144.67

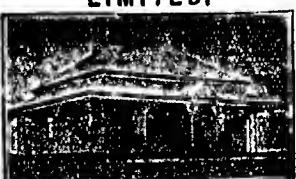
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NORWOOD.

MOUNT GAMBIER AND DISTRICT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1924.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during March.	Per Cow during March.	Per Cow August to March.	Per Herd during March.	Per Cow during March.	Per Cow August to March.
2/A	15	15	6866.5	457.77	4202.99	350.91	23.39	170.84
2/B	9	7.19	5591	621.22	6321.05	238.57	26.51	228.89
2/E	12	11.61	7082	590.16	5153.58	319.79	26.65	215.66
2/H	24.97	24.35	12737.5	510.11	5178.27	395.94	23.87	206.08
2/I	14	13.08	7269	519.21	5356.95	323.24	23.09	209.34
2/J	13	13	7951.5	611.65	6054.75	372.92	28.69	268.67
2/K	24.48	21.29	11053	451.51	4615.54	460.78	19.07	176.40
2/L	23.48	20.06	10565	449.95	3498.96	520.99	22.19	155.90
2/O	31.16	19.90	9762	313.28	3645.76	441.70	14.18	139.61
2/R	16	15.32	12486.5	780.41	7866.50	477.81	29.86	309.32
2/S	6	6	3363.5	560.58	6258.19	162.74	27.12	282.65
2/T	12	12	8447.5	703.96	6179.34	365.79	30.48	233.71
2/U	17	13.58	5151.5	303.03	5880.68	234.08	13.77	230.33
2/V	21	17.10	5634	269.24	3484.16	264.62	12.60	141.39
2/W	16	9.13	5379	336.19	6239.91	232.66	14.54	227.57
2/Y	12	10.90	7328.5	610.71	6013.63	326.09	27.17	241.25
2/B _P	9	8	3425.5	380.61	4305.61	144.82	16.09	164.93
2/C _O	13	11.61	4125.5	317.34	3828.66	194.02	14.92	163.77
Means	16.06	13.87	7457.72	464.35	4985.70	335.19	20.87	187.74

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A. G. RYMILL.

JAMES H. GOSE.

SIR GEORGE BEECHMAN, K.B.E.

Pastoral and Agricultural Inspector ... CHARLES GRINN.

Manager E. W. WILLIAMSON.

22, GRENFELL STREET - - ADELAIDE

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, April 28th, there being present Capt. S. A. White (Vice-Chairman), Professor Arthur J. Perkins, Col. C. Rowell, Hon. W. G. Duncan, M.L.C., and Messrs. Geo. Jeffrey, C. J. Tuckwell, J. W. Sandford, H. S. Taylor, P. H. Jones, W. J. Colebatch, H. Wicks, C. A. Loxton, B.V.Sc., A. B. Feuerheerdt, A. M. Dawkins, and F. Coleman. An apology was received from Mr. L. Cowan, B.Sc.

Welcome to New Board Members.—The Acting Chairman (Mr. Geo. Jeffrey) extended a cordial welcome on behalf of the Board to the recently appointed members, Hon. W. G. Duncan, M.L.C., and Messrs. C. A. Loxton, B.V.Sc., and A. B. Feuerheerdt. The Acting Chairman (Mr. Geo. Jeffrey) also said how pleased members were to again have Capt. White with them after his prolonged illness.

The Secretary was instructed to express the thanks of the Board to Sir William Sowden for his kindness in presenting to the Board a number of copies of an article dealing with afforestation for distribution amongst the Branches of the Bureau.

Cream Inspection.—Mr. C. J. Tuckwell referred to cream inspection methods adopted in Canada, and the Secretary was instructed to secure information with respect thereto.

Experimental Plot for Tantanoola.—Dealing with a request from the Tantanoola Branch asking that an expert might be sent to their district to report on the feasibility of utilising water for irrigation purposes, it was decided, on the suggestion of the Director of Agriculture, that the Manager of the Kybybolite Experimental Farm should visit Tantanoola for the purpose of making inquiries in the direction suggested.

Appointment of Life Member.—In response to a suggestion that a former officer should be appointed a life member of the Advisory Board, the Minister of Agriculture stated that he did not think it advisable to make any such appointment.

Horchhound.—The Board decided to ask the Government to add "horchhound" to the list of proclaimed noxious weeds.

Airless Storage of Fruit.—In commenting on the request of the Blackwood Branch for a report dealing with the "airless" method of storage for fruit, the Horticultural Instructor (Mr. Geo. Quinn) stated that from information that he had been able to gather from the neighboring States the process involved cumbersome and expensive containers, which, in Mr. Quinn's opinion, would place the scheme outside of practical adoption in shipping fruit overseas, even if it proved effective in preserving the fruit. The Secretary was instructed to advise the Blackwood Branch in terms of Mr. Quinn's report.

Horse Judges.—The Lipson Branch asked—"That the Advisory Board be asked to supply a list of prominent horse judges." It was decided that the desired information should be sought from the Clydesdale Horse Society and the Royal Agricultural and Horticultural Society.

Crop Competition, Lameroo.—Mr. P. H. Jones, of Pinnaroo, was deputed to represent the Board at the forthcoming meeting for the distribution of prizes.

Resolutions from Mid-Northern Conference.—The following resolutions were received:—(a) That action be taken by the Advisory Board of Agriculture to bring before the Government the necessity for safeguarding farmers against being supplied with cornsacks that are smaller than the Chapman standard, because fully half of the cornsacks in the district this year were 1½in. narrower than the standard". (b) "That this Conference is in favor of the action of the local government bodies in their efforts to bring about the repeal of the new Width of Tires Act"; (c) "That this Conference urges its members to use their influence against the growing of red wheats".

Destruction of Foxes.—The Mid-Northern Conference resolved—"That in the opinion of this Conference it is desirable that the Advisory Board be asked to urge on the Government the necessity for bringing in legislation to provide for the simultaneous destruction of foxes along similar lines to those adopted for the destruction of rabbits." The Board decided to support the resolution in so far as the destruction of foxes came within county boundaries.

Resolutions from Lower Northern Conference.—The following resolutions were received—"That the Government be asked to compel all landholders to destroy foxes and that the destruction of such be under the supervision of the Minister of Crown Lands, and that a simultaneous destruction be made during the months of February, March, and April, and that the Government be asked to deal with Crown lands, water reserves, and forest reserves"; (b) "That the members of this Conference use their influence in the direction of deterring farmers from growing red wheats."

Rural Science Course for Women.—The Riverton Conference carried the following resolution—"That the Women's Branches of the Agricultural Bureau situated in the lower northern areas of the State are very favorably impressed with the advisability of inaugurating a short course of domestic science for rural women on the lines suggested by the Advisory Board of Agriculture, and would ask the Government to give favorable consideration to the proposal." It was decided to transmit the resolution to the Minister of Agriculture for his information.

Separate Congress for Branches interested in Horticulture and Viticulture.—At the Conference of Lower Northern Branches it was decided—"That this Conference recommends that a separate two days' annual Congress be granted to those Branches interested in the viticultural and horticultural industries." A resolution from the Blackwood Branch supporting this request was also received. The

What About It

FORDSON TRACTORS



One is often inclined to think that the dog that barks loudest is necessarily the biggest.

Just study this record of Tractor production in America, then ask yourself if you are quite fair to yourself in delaying your decision.

In 1917 the FORDSON TRACTOR was put on the market.

Below is a comparison with FORDSONS with ALL OTHER MAKES COMBINED:—

1917	254	Fordson's made,	62,488	All Others
1918	34,167	"	100,833	"
1919	57,290	"	117,710	"
1920	70,955	"	132,045	"
1921	36,780	"	13,220	"
1922	68,985	"	23,015	"

The FORD COMPANY has produced 41 per cent. of all American Tractors in 1921, and in 1922 produced 74.3 per cent. of all the Tractors made during that year.

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59, FRANKLIN STREET, ADELAIDE.

Board decided that at the 1924 Congress one session should be devoted to matters dealing with horticultural and viticultural subjects.

Dry-Farming Plough.—Plans of a dry-farming plough were submitted to the Board by Mr. E. E. Craig, of Mile End. The Board decided to ask the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch) to furnish a report on the practicability of the implement.

Date of May Meeting.—It was decided to hold the next meeting of the Board on May 13th, at 2.30 p.m.

Life Membership.—It was decided to add the name of Mr. J. J. Odgers (Hon. Secretary of the Rameo Branch) to the list of life members of the Agricultural Bureau.

New Branch.—Approval was given for the formation of a Branch of the Agricultural Bureau at Rudall, with the following gentlemen as foundation members:—H. W. Fitzwater, P. J. Smalacombe, G. A. R. W., and J. F. Potter, A. J. Hutchinson, C. T. Brittan, J. R. Smith, J. R. Darby, J. F. and R. R. Crabb, W. C. Hampel, H. W. Watkins, W. F. Wake.

New Members.—The following names were added to the rolls of existing Branches:—Rosedale—J. Partridge; Naracoorte—H. J. H. Pluckhahn, T. E. Ekers; Kangarilla—K. Thorpe, W. Turner, R. Pinder; Murray Bridge—A. B. Bowden; Redhill—W. Guthrie; Balaklava—C. W. Hill, J. Treloar; Clare—J. E. Butler; Kalangadoo (Women's)—Mrs. L. Hill, Miss Hill; Coonalpyn—A. Drummond; Saddleworth—L. Baldwin; Morehard—L. G. Gardiner; Lyndoch—S. Auld; Paskeville—T. H. Perry; Morphett Vale—G. L. Hercock; Warowie—T. Ryan, jun., P. Shimnick; Nantawarra—A. Greenshields; Yeclanna—S. J. Heard, L. Gentle, H. Bains, B. Skipworth, J. Harsma; Mypolonga—E. J. Petney, P. H. Pickering, G. G. Hall, H. Dnell, W. Rhue, A. E. Weidenhoffer, G. H. Weidenhoffer, A. D. Oburn, H. Kleenan; McLaren Flat—P. Kyto, W. Wickham; Arthurton—H. T. Walding, R. Power; Bundaleer Springs—P. Moebus, M. Lammers; Wirrulla—E. H. Lovegrove, C. Lovegrove, A. A. Schar; Mundalla—C. Dinning; Shoal Bay—H. K. Robinson; Mannanarie—H. Jones; Farrell's Flat—V. Gaskill; Strathalbyn—H. Hooper, F. G. Rose, J. Wood; Gladstone—L. G. Stevens; Wynarka—P. B. Rushworth; Mount Schank—E. Pudney, H. Pudney, W. Ashby, Jas. Fox, R. Hasting; Mount Gambier—C. Kentish; Tantanoola—C. C. Nitschke, T. Edgmont; Tatiara—W. Butler; Pinnaroo—F. Venning, L. Venning, G. R. J. Venning, G. Tiller; Hartley—C. Cross; Rosedale—L. Heinjus; Salisbury—A. Treloar, L. Treloar, R. Treloar; Parilla—F. Haimau, C. Schumacher, H. Schumacher; Farrell's Flat—G. Miller; Netherton—R. A. Brokensha; Lameroo—J. S. Roberts; McLachlan—B. Dawson; B. West; Mundalla—G. Toll; Redhill—J. Dundor; Light's Pass—P. G. Edwards, A. S. Gilligham; Rockwood—G. D. Mudge, W. G. Mudge; F. A. Mudge, F. Darwin; Talia—J. McNamara; Goode—C. Gene.

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Is your herd giving you the returns it should? Are you getting the money value your hard work deserves? Are you allowing your brains to save your body?

Sick cows increase your work and reduce your returns. Systematic drenching means healthy cows and larger returns for less work, worry, and trouble.

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have stood the test of years of use and are to-day acknowledged throughout Australia to be

ABSOLUTELY RELIABLE.

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Full Supplies of INTERNATIONAL STOCK FOOD COY.'S REMEDIES on hand.

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Seed Merchants,
CORNER RUNDLE ST. & EAST TERRACE.

For all classes of soil,
For all makes of Plows and
Cultivators,

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FORGAN'S Cast Chilled Shares

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22, KING WILLIAM STREET, ADELAIDE.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR MAY, 1924.

[By C. H. BEAUMONT, Orchard Instructor.]

This month will be one of preparation for winter work; probably the first thing to be attended to will be planting of young trees. It will, of course, depend on the weather; but as soon as the ground will break up nicely, the nurseryman can lift the trees and planting may proceed. Have the land well prepared beforehand, so that all that is necessary is to clean out the holes and get the trees in. Do not plant in land unless it has been sweetened by being fallowed for at least one season. Do not waste time and trees by planting in the scrub. Do not plant deeply; the crown of the tree should not be more than 4in. deep, and the roots should slope downwards to about 7in. or 8in. Fasten the young tree to a stake to help it to get a firm hold. Prune as soon as possible after planting.

Give young citrus trees some water if rain be delayed.

See that ploughs and implements for working the land are in good order and ready for work; harness and chains also need attention.

Get drying trays and picking bags and cases cleaned out and housed away. Spray pumps and fittings need to be thoroughly cleaned before being put away; this applies especially to hoses and nozzles.

Pruning may be commenced; do the stone fruits first, then the grapes, and finish with the apples and pears. Make sure that secateurs and saws are sharp and clean. Prune bearing trees lightly as a general rule; young trees need to be pruned according to the growth, to make a stiff frame.

Plough to the trees as soon as you conveniently can, and leave in the rough, taking care to make ample getaway for flood waters.

Remember that fruit in cool store requires attention and repacking at intervals.

Citrus trees will need watching for "brown rot"; keep the lower limbs well off the ground, and do not allow water to remain about the trees. Straw of any kind serves a good purpose if spread under the tree, by preventing splashing.

THE AGRICULTURAL OUTLOOK.

REPORTS FOR THE MONTH OF APRIL.

The following reports on the general Agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective Managers:—

Booroorrie.—Weather.—The weather for April has been characterised by its coolness, with a fair quantity of useful rain, 176 points having been registered up to the time of writing, making a total of 581 points for the year. Crops—

A few isolated paddocks that have been sown to oats on stubble land are showing a green tinge. The lucerne fields are producing fair quantities of fodder. Natural feed is plentiful. Stock—All livestock are in good condition. Pests—Nothing worth mentioning as regards pests. Miscellaneous—Seeding will be quite general by the first week in May.

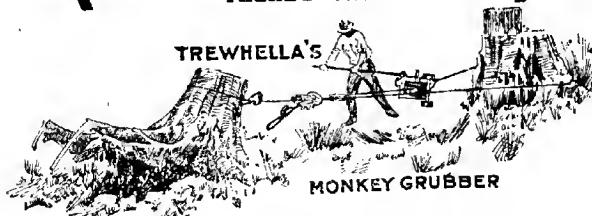
Eyre Peninsula.—Weather—Exceptionally warm weather for this time of the year. There have been 25 points of rain for this month. The present weather promises to lead up to good seeding conditions ere long. Crops—The majority of settlers have commenced seeding in earnest, some having sown considerable areas up to date. Now and stubble land is, of course, safe, but fallow is dangerously moist to seed without a good rain. Natural feed has all dried and is of little feeding value. Stock, unless hand fed, are falling away in condition, but seem remarkably healthy, especially horses. Pests—Rabbits are numerous, but settlers are keeping at them with poisoning, &c. Miscellaneous—A number of settlers are water carting, but there is still a good supply in all the Government tanks around these districts.

Turretfield.—Weather—The weather this month has been dull and cool. Many days have started with misty rain, others with heavy dews or frosts. Crops—Grape cutting has been pushed on as quickly as possible, but there still remain many acres unpicked. The cool summer and heavy growth of foliage have made the ripening very late indeed. Natural feed is scarce, except in the hills and where the rainfall was heavier. Stock—Sheep are suffering from the effect of eating stinkwort. Pests—Rabbits are numerous. Miscellaneous—A few farmers have started seeding, but many are holding back on account of the uncertain weather and bad condition of the soil.

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With these men at your disposal you could do quite a bit of clearing. In the "Monkey" Grubber you get their strength, without the upkeep, in a simple, compact, easy to-handle form. With the shot lever supplied, the power is in your own hands. This sturdy machine is equipped with ropes equal to the heavy demands made on grubbing tackle, and each is fitted with hook and loop couplings—splices and loose pins have been banished. A fast gear and rope shortener help you to get quickly to the actual pull, and an automatic lowering gear allows you to release from a strain. Standard equipment will clear $1\frac{1}{2}$ acres from an anchor.

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TREWHELLA BROS. PTY. LTD., TRENTHAM, VIC.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on May 1st, 1924:—

BUTTER.—As anticipated in our last report, supplies recorded a seasonable shrinkage for all grades, especially choicest qualities, and heavy importations have had to be brought along from the eastern States to supply the trade locally. In the early part of the month several parcels of second and third grade butters were shipped to oversea buyers, but towards the end these grades also decreased in quantities, and are now being absorbed by the local demand. Values have improved considerably, owing to the shortage in local production and importations having to be brought in. Values:—Choicest factory and creamery fresh butter, in hulk, 1s. 6½d.; first grade, bulk, 1s. 3½d.; second and third grade, bulk, 1s. 1d. to 1s. 1½d.; best separators and dairies, 1s. 4½d. to 1s. 6d.; fair quality, 1s. 3½d. to 1s. 4d.; store and collectors' lines, 1s. 1½d. to 1s. 3½d.

Eggs.—During the last few sales a seasonable shrinkage in supplies has been felt, and buyers have been operating exceptionally briskly for their quantities, values advancing to the prices of fresh hen, 1s. 1½d.; duck, 2s. dozen.

CHEESE.—Several fluctuations in values of this commodity have occurred, for although the price was reduced to as low as 7d. per lb., the lessening in quantities coming forward from the South-Eastern factories has improved the local prices, and good clearances have been effected with all coming to hand at the higher rates, namely:—New makes, 9½d. to 11d. per lb. for large to loaf; semi-matured large selling from 10½d. to 11d. per lb., but with fully-matured consignments the demand is rather slow, no doubt due to the heavy stocks which are being held; prices are nominally 11½d. to 1s. per lb.

HONEY.—An excellent trade has been done with local and interstate buyers, although to meet competition a reduction of 1d. per lb. was brought about, so as to retain the New South Wales trade. Values are as follows:—Prime clear extracted in liquid condition, 5d. to 5½d.; best quality candied lots, 4½d.; lower grades, 2½d. to 3d.; beeswax readily saleable 1s. 4d. to 1s. 4½d.

ALMONDS.—Most substantial quantities have been marketed during the month, and with the lack of interstate orders a lowering in values was brought about. However, values are now stationary, and all lots are being cleared at the following rates:—Brandis, 8d. to 8½d.; mixed softshells, 7d. to 7½d.; hardshells, 4d. Kernels short of demand at 1s. 7½d. to 1s. 8d.

BACON.—It is pleasing to report that supplies from local curers have improved, and although a lowering in price was anticipated, this did not come about, on account of the strong demand which is being experienced for all lines of bacon. Several shipments have arrived from Victoria, composed mostly of middles, for which the trade has experienced difficulty in securing their wants. Best factory-cured sides, 1s. 4d.; middles, 1s. 7½d. to 1s. 8d.; rolls, 1s. 3½d. to 1s. 4d.; hams, 1s. 6d. to 1s. 6½d.; Hutton's "Pineapple" brand hams, 1s. 8d. per lb. to 1s. 9d. per lb.; Hutton's "Pineapple" middles, 1s. 7½d. Lard—Hutton's "Pineapple" brand lard, in packets, 1s.; in bulk, 11d.

LIVE POULTRY.—Since the Easter sales farmers have been wisely forwarding their surplus birds, as the supplies have been rather short after the holidays, with the result that values have improved, especially where consignments consisted of prime condition birds. As usual, many lots consisted of birds of light condition; the market absorbed these at fairly satisfactory prices. We advise con signing so as to secure these remunerative rates. Crates forwarded to my address on application. The following rates ruled to-day:—Prime roosters, 5s. to 7s. each; nice-conditioned cockerels, 3s. to 4s. 6d.; poor-conditioned cockerels, 1s. 6d. to 2s. 6d.; plump hens, 3s. 6d. to 5s.; medium hens, 2s. 3d. to 3s. 3d.; light hens, 1s. 10d. to 2s. 2d.; some pens of weedy sorts lower; geese, 5s. to 6s. 9d.; ducks, good condition, 3s. 6d. to 5s. 9d.; ducks, fair condition, 2s. 4d. to 3s. 3d.; turkeys, good to prime condition, 1s. to 1s. 5d. per lb. live weight; turkeys, fair condition, 9d. to 11½d. per lb. live weight; turkeys, fattening sorts, lower; pigeons, 7d. each.

POTATOES.—Prime new Ballarat Carmens, at 8s. to 9s. per ewt. on rail, Mile End.

ONIONS.—Best brown onions, at 8s. 6d. per ewt. on rail.

Over **4,000** Primary Producers,
in addition to **HUNDREDS** of business houses,
have placed their **TAXATION** matters in our hands.
WE SAVE THEM
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WE CAN DO THE SAME FOR YOU.

The first year we supply you with our AUTOMATIC INCOME TAX COMPILER (which carries with it 12 months' FREE SUBSCRIPTION to our TAXPAYERS' INFORMATION AND SERVICE DEPARTMENT) wherein you record your transactions under the different headings as they occur. From these records we compile both your

STATE AND FEDERAL INCOME TAX RETURNS,

check ASSESSMENTS, and so forth, FREE of extra charge.

Price, £2 15s., including Automatic Income Tax Compiler and 12 months' free subscription to our Taxpayers' Information and Service Department.

Important.—After the first 12 months the same service will be rendered from 10s. 6d. per annum.

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(Late of State Taxation Dept.)

A. SAIDE, A.F.I.A., Secretary
(Late of Federal Taxation Dep't.).

IMPORTS AND EXPORTS OF FRUIT, PLANTS, ETC.
MARCH, 1924.

IMPORTS.

Interstate.

Apples (bushels)	100
Bananas (bushels)	4,959
Passion fruit (bushels)	21
Pears (bushels)	4
Pineapples (bushels)	165
Grapes (bushels)	1
Swedes (packages)	1
Potatoes (bags)	14,760
Onions (bags)	1,592
Bulbs (packages)	21
Plants (packages)	7
Seeds (packages)	25
Wine casks, empty (number)	2,990

Rejected—1 bushel apples, 1 bushel grapes, 6 second-hand cases, 260 bags potatoes.

Fumigated—22 wine casks.

Overseas.

Federal Quarantine Act.

One thousand five hundred and ninety-six packages seeds, &c.

EXPORTS.

Federal Commerce Act.

Six thousand four hundred and sixty-three packages dried fruit, 93,183 packages fresh fruit, 2 packages honey, 60 packages citrus fruit, 1 package jam, and 3 packages preserved fruit were exported to overseas markets. These were consigned as follows:

London.

Dried fruit	5,991
Honey	2
Apples	91,939
Pears	740
Grapes	22
Plums	7
Quinces	2

India and East.

Dried fruit	32
Grapes	180
Apples	292
Pears	1

New Zealand.

Dried fruit	440
Citrus fruit	60

Argentina.

Jam	1
Sauce	1
Chutney	1
Pickles	1

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of April, 1924, also the average precipitation to the end of April, and the average annual rainfall.

STATION.	For April, 1924.	To end April, 1924.	Avg't. to end April.	Avg't. Annual Rainfall	STATION.	For April, 1924.	To end April, 1924.	Avg't. to end April.	Avg't. Annual Rainfall
FAR NORTH AND UPPER NORTH.									
Adatta	0.69	1.43	2.11	4.94	Spalding	1.31	5.45	3.28	20.27
Albion	0.24	1.26	1.84	6.07	Gulnare	1.60	6.50	3.13	19.36
Albion	0.40	1.22	2.17	6.66	Yacka	1.97	5.83	2.08	15.48
Albion	0.43	1.26	2.51	8.39	Koelunga	1.72	4.91	3.21	15.89
Albion	0.19	0.71	2.75	8.97	Snowtown	1.68	4.44	3.18	16.07
Albion	0.31	1.23	3.45	12.53	Brinkworth	1.88	4.90	2.82	16.30
Albion	0.62	2.07	2.20	7.74	Blyth	1.57	6.25	3.45	17.03
Albion	—	0.86	2.68	13.46	Clare	2.42	7.70	3.69	24.68
Albion	0.15	1.10	2.75	12.92	Mintaro	1.43	5.56	3.93	23.57
Albion	0.10	1.65	2.82	12.58	Watervale	2.19	7.19	5.10	27.54
Albion	0.14	1.91	2.83	11.55	Auburn	1.25	4.73	4.87	24.35
Albion	0.29	2.09	3.00	14.21	Hoyleton	1.16	4.62	3.61	17.91
Augusta	0.33	3.25	2.63	9.67	Balaklava	1.23	4.59	3.52	15.95
Augusta West	0.23	2.91	2.50	9.71	Port Wakefield	0.71	4.79	3.39	13.28
Augusta	0.28	2.18	2.53	10.77	Terowie	0.56	2.60	3.21	13.82
Augusta	0.31	2.63	3.05	11.91	Yarowie	0.81	2.68	3.33	14.22
Augusta	1.20	4.34	3.83	18.29	Hallett	0.81	4.45	3.21	16.49
Augusta	0.27	3.03	3.01	12.57	Mount Bryan	1.11	5.60	3.00	18.81
Augusta	0.15	2.58	4.94	23.40	Burra	0.64	1.60	3.59	18.09
Augusta	0.46	3.49	3.36	15.65	Farrell's Flat	0.96	4.95	3.60	19.00
Barmera	1.09	3.86	3.08	12.89	LOWER NORTH, CONTRASTED.				
Barmera	1.05	4.63	3.50	19.78	LOWER NORTH, EAST.				
Barmera	0.86	5.81	3.26	15.00	WEST OF MURRAY RANGE.				
Barmera	0.11	1.26	1.68	11.52	LOWER NORTH, EAST.				
Barmera	0.39	2.52	2.85	12.90	WEST OF MURRAY RANGE.				
Barmera	0.52	2.19	2.44	10.91	LOWER NORTH, EAST.				
Barmera	0.23	2.03	3.06	13.54	WEST OF MURRAY RANGE.				
Barmera	0.31	1.95	3.38	13.73	WEST OF MURRAY RANGE.				
Barmera	0.13	1.50	3.06	11.99	WEST OF MURRAY RANGE.				
Barmera	0.32	2.22	3.10	12.75	WEST OF MURRAY RANGE.				
Barmera	0.36	1.71	2.74	12.04	WEST OF MURRAY RANGE.				
Barmera	0.66	2.92	3.27	13.53	WEST OF MURRAY RANGE.				
Barmera	0.93	3.50	3.16	14.58	WEST OF MURRAY RANGE.				
LOWER NORTH.									
Barmera	1.07	4.42	3.18	13.55	ADELAIDE PLAINS.				
Broughton	1.44	4.40	3.08	14.29	LOWER NORTH.				
Broughton	1.81	4.31	3.12	15.78	ADELAIDE PLAINS.				
Broughton	1.13	3.63	3.74	18.26	LOWER NORTH.				
Broughton	0.99	4.38	3.60	17.20	ADELAIDE PLAINS.				
Broughton	1.33	5.21	3.52	17.89	LOWER NORTH.				
Broughton	1.58	6.57	3.17	18.09	ADELAIDE PLAINS.				
Broughton	1.21	6.07	3.42	16.29	LOWER NORTH.				
Broughton	0.76	6.00	3.32	15.95	ADELAIDE PLAINS.				
Broughton	1.25	5.97	3.81	18.55	LOWER NORTH.				
Broughton	0.75	3.86	3.43	16.37	LOWER NORTH.				
Broughton	1.08	3.83	3.41	16.94	LOWER NORTH.				

RAINFALL—continued.

Station.	For April, 1924.	To end April, 1-24.	Avg'e To 1st April.	Avg'e Annual Rainfall	Station.	For April, 1924.	To end April, 1-24.	Avg'e To 1st April.
MOUNT LOFTY RANGES.								
Teatree Gully.....	1.88	7.55	5.09	27.77	Talia.....	0.34	1.91	1.91
Stirling West.....	2.79	12.16	8.35	43.82	Port Elliot.....	0.71	2.65	2.42
Uraida.....	2.34	10.19	7.74	44.23	Cummins.....	0.42	1.61	1.61
Clarendon.....	1.18	7.33	6.35	33.09	Port Lincoln.....	0.95	2.49	3.39
Morphett Vale....	1.06	7.07	4.65	22.90	Tumby.....	0.34	1.65	2.47
Noarlunga.....	0.85	7.18	4.01	20.41	Carrow.....	0.36	1.13	2.79
Willunga.....	0.47	6.90	4.75	25.99	Arno Bay.....	0.39	1.79	2.75
Aldinga.....	0.49	5.20	3.91	20.44	Cowell.....	0.72	2.37	3.42
Myponga.....	0.85	7.55	4.33	29.80	Minnipa.....	0.25	2.48	3.11
Normanville.....	0.50	5.63	3.85	30.70				
Yankalilla.....	0.69	6.03	4.35	23.31				
Mount Pleasant	1.03	4.10	4.86	27.28				
Birdwood.....	1.01	4.41	5.10	29.39	Wallaroo.....	1.58	4.62	3.15
Gumeracha.....	1.95	6.99	5.75	33.36	Kadina.....	2.54	5.24	3.16
Millbrook Reservoir	1.69	7.98	4.78	36.21	Moonta.....	1.98	5.41	3.63
Tweedvale.....	1.46	6.94	5.79	35.65	Green's Plains.....	1.47	4.40	3.06
Woodside.....	1.33	6.26	5.35	32.20	Maitland.....	1.27	7.62	3.81
Ambleside.....	1.30	7.52	5.90	34.82	Ardrossan.....	0.52	3.71	2.95
Nairne.....	1.24	6.06	5.33	28.44	Port Victoria.....	1.03	4.34	3.65
Mount Barker.....	1.39	6.59	5.63	31.30	Curramulka.....	0.27	4.00	3.41
Echunga.....	1.37	6.98	6.02	33.06	Minlaton.....	0.64	3.60	3.28
Macclesfield.....	0.96	5.89	5.59	30.65	Brentwood.....	0.59	3.07	2.92
Meadows.....	1.46	9.64	6.61	33.19	Stansbury.....	0.80	3.64	3.26
Strathalbyn.....	0.94	5.55	3.93	19.37	Waroona.....	0.68	3.53	3.03
					Yorketown.....	0.74	4.01	3.09
					Edithburgh.....	0.37	3.72	3.1
MURRAY FLATS AND VALLEY.								
Meningie.....	1.27	6.68	3.86	18.74				
Milang.....	0.87	4.68	3.37	15.45	SOUTH AND SOUTH-EAST.			
Langhorne's Brdg.	0.92	4.78	3.19	14.77	Cape Borda.....	1.33	4.37	3.66
Wellington.....	0.70	4.59	3.24	14.80	Kingscote.....	0.32	2.12	3.21
Taihem Bend.....	0.81	4.96	3.05	14.68	Penneshaw.....	1.15	2.05	3.09
Murray Bridge....	0.73	3.91	3.34	13.94	Victor Harbor.....	0.94	4.45	4.16
Callington.....	0.70	3.99	3.35	15.49	Port Elliot.....	0.94	4.46	4.63
Mannum.....	0.71	3.41	2.92	11.66	Goolwa.....	0.63	4.23	3.76
Paltmer.....	0.56	2.25	3.03	15.45	Pinnaroo.....	0.68	3.66	3.32
Sedan.....	0.07	2.17	2.77	12.27	Parilla.....	0.52	3.24	2.53
Swan Reach.....	—	2.58	2.50	11.06	Lameroo.....	0.78	5.26	3.12
Blanchetown.....	0.10	2.44	2.64	10.09	Parrakie.....	0.77	4.07	2.47
Eudunda.....	0.40	2.94	3.60	17.51	Geranium.....	0.95	4.76	2.88
Sutherlands.....	0.02	2.49	2.19	11.20	Peak.....	1.11	5.80	2.38
Morgan.....	0.16	2.70	2.18	9.30	Cooke's Plains.....	0.85	5.75	3.18
Waikerie.....	0.04	3.36	2.63	9.87	Coomadook.....	0.85	5.77	3.13
Overland Corner ..	—	2.50	2.87	11.03	Coonalpyn.....	1.40	6.79	3.44
Loxton.....	0.19	3.21	3.13	12.50	Tintinara.....	1.48	6.40	3.41
Renmark.....	0.06	2.55	2.78	11.06	Keith.....	1.22	5.79	3.16
Monash.....	0.16	2.94	—	—	Bordertown.....	1.09	6.69	3.78
					Wolseley.....	1.08	6.23	3.46
WEST OF SPENCER'S GULF.								
Eucla.....	—	1.18	3.12	10.01	Frances.....	1.10	5.54	3.70
White Well.....	0.75	2.73	2.06	9.20	Naracoorte.....	1.04	7.00	3.27
Fowler's Bay.....	0.17	1.94	2.24	12.14	Penola.....	1.48	6.49	4.06
Penong.....	0.20	3.51	2.46	12.53	Lucindale.....	1.83	7.85	4.06
Ceduna.....	—	2.04	1.80	10.25	Kingston.....	1.93	7.01	4.26
Smoky Bay.....	0.21	1.61	1.90	10.98	Robe.....	1.07	5.46	4.26
Petina.....	0.23	1.91	2.01	12.95	Beachport.....	1.04	4.91	4.56
Streaky Bay.....	0.20	1.81	2.56	18.07	Millicent.....	2.77	8.06	5.52
					Kalangadoo.....	2.38	9.95	4.49
					Mount Gambier	2.06	7.97	6.12

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings		Branch.	Report on Page	Dates of Meetings	
		May.	June.			May.	June.
Alawonga	*	—	—	Gladstone	†	16	13
Aldinga	†	21	18	Glenoe	*	—	19
Allandale East	†	23	20	Glossop	†	21	18
Anyton	*	19	16	Goode	*	21	18
Angaston	*	—	—	Green Patch	*	19	16
Appila-Yarrowie	*	—	—	Gumeracha	*	19	16
Arthurton	1008	—	—	Halidon	*	—	—
Ashbourne	*	—	—	Hartley	*	14	11
Balaklava	*	10	14	Hawker	*	20	17
Balannah	*	9	6	Hilltown	*	—	—
Barmera	*	19	16	Hookina	*	15	12
Betaloo Valley	*	19	16	Iman Valley	*	—	—
Belalie North	*	17	14	Ironbank	*	17	14
Berti	†	21	18	Kadina	*	—	—
Latel	1002	—	—	Kalangadoo (Women's)	1015	10	14
Big Swamp	*	—	—	Kalangadoo	*	10	14
Blackheath	†	16	20	Kangarilla	*	16	—
Black Springs	†	13	17	Kammantoo	*	17	14
Blackwood	†	19	16	Keith	*	—	—
Block E	*	—	—	Ki Ki	*	—	—
Blyth	†	3	7	Kilkerran	†	13	17
Booreroo Centre	*	16	14	Kimbe	*	—	—
Borika	*	—	—	Kingston-on-Murray	*	—	—
Brentwood	1007	15	12	Kongorong	*	15	12
Brinkley	*	17	14	Koonibba	*	16	13
Bundaleer Springs	*	—	—	Koppio	*	19	16
Bute	*	13	17	Kringin	*	—	—
Butler	1011	—	—	Kybybolite	*	16	12
Calca	*	—	—	Lake Wangary	*	17	14
Castell	*	—	—	Lameroo	*	16	20
Canowie Belt	*	—	—	Laura	*	17	14
Carow	*	14	11	Lenswood and Forest Range	*	—	—
Cherry Gardens	1014	13	17	Light's Pass	1007	—	—
Clanfield	*	—	—	Lipson	1011	—	—
Clare	1007	16	—	Lone Gumand Monash	1012	14	11
Clarendon	*	12	16	Lone Pine	*	—	—
Claypan Bore	*	21	18	Longwood	*	—	—
Cleve	*	14	11	Loxton	*	—	—
Collie	*	17	21	Lucindale	*	—	—
Coiton	*	30	27	Lyndoch	†	15	12
Commandook	†	14	11	McLachlan	*	—	—
Coonsipyn	1012	16	20	McLaren Flat	1015	—	—
Cradock	*	—	—	MacGillivray	A.M.	13	17
Crystal Brook	*	17	14	Maitland	*	15	12
Congena	*	—	—	Mailala	*	19	16
Currency Creek	†	16	20	Maltee	*	16	13
Cygnet River	1015	16	12	Mangalo	*	—	—
Derke's Peak	†	—	—	Mannanarie	†	15	12
Denial Bay	*	—	—	Marama	†	—	—
Edilchie	*	31	28	Meadows	*	14	11
Elbow Hill	*	20	17	Menungie	*	—	—
Eucla	*	—	14	Milang	†	10	14
Farrell's Flat	†	16	13	Millicent	*	3	7
Frances	1016	31	28	Miltalie	*	17	14
Gawler River	*	19	16	Mindarie	*	5	2
Georgetown	*	17	14	Minlaton	*	16	13
Geranium	†	31	28				

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Branch.	Report on Page	Date of Meetings.		Branch.	Report on Page	Date of Meetings.	
		May.	June.			May.	June.
Minnipa	*	14	11	Roberts and Verran	1010	15	12
Monarto South	†	—	—	Rockwood	†	19	15
Moonta	†	16	13	Rosedale	†	—	—
Moorak	*	15	12	Roey Pine	*	—	—
Moorlands	*	—	—	Siddleworth	*	—	—
Moorook	*	19	16	Saddlerville	1006	13	10
Morchart	1001	17	14	(Women's)			
Morphett Vale	*	22	19	Salisbury	†	6	3
Mount Barker	*	14	11	Salt Creek	†	—	—
Mount Bryan	*	—	—	Sandalwood	*	—	—
Mount Bryan East	*	—	—	Shoal Bay	†	13	17
Mount Compass	*	—	—	Smoky Bay	†	17	14
Mount Gambier	1016	10	14	Spalding	*	—	—
Mount Hope	†	17	14	Stockport	1007	—	26
Mount Pleasant	†	—	—	Streaky Bay	†	—	—
Mount Remarkable	*	—	—	Strathalbyn	†	13	17
Mount Schank	†	13	17	Talia	†	12	14
Mundalla	*	14	11	Fantamoola	†	17	14
Murray Bridge	†	—	—	Fapan	*	13	17
Mypolonga	1014	14	11	Tarcowie	1002	13	17
Myponga	*	—	—	Tarlee	†	20	17
Myrla	*	17	14	Tatiara	1015	17	21
Nantawarra	1002	15	12	Tweedvale	†	15	19
Naracoorte	1016	10	14	Two Wells	1006	—	—
Narridy	1002	17	21	Uralla & Summertown	*	5	2
Narrung	*	17	21	Veitch	—	—	—
Neeta	—	—	—	Virginia	—	—	—
Ni-lahatby	*	17	14	Walerie	—	—	—
Netherton	1014	16	14	Wall	—	—	—
New Residence	1014	—	—	Wanbi	—	—	—
North Buxton	†	13	17	Warcowie	—	11	16
North Bundaleer	†	—	—	Wat-ryale	—	—	—
Northfield	*	—	—	Weavers	1008	19	16
Nunkeri and Yurgo	*	4	1	Wepowie	1001	13	17
O'Loughlin	*	14	11	White-Yarcowie	—	—	—
Orroroo	*	—	—	Wilkawatt	—	17	14
Owen	1004, 1007	16	13	Williamstown	†	7	4
Parilla	†	16	13	(Women's)			
Parilla Wall	*	19	16	Williamstown	—	16	13
Parrakie	*	—	—	Willowie	—	14	11
Paruna	*	—	—	Wilmington	—	14	11
Paskerville	†	16	13	Windsor	—	—	—
Pata	*	—	—	Winkie	—	—	—
Penda	†	3	7	Wirrataura	—	—	—
Petina	1011	24	28	Wirregga	—	—	—
Pinnaroo	*	10	15	Wirribi	—	17	14
Pompoona	*	14	11	Wirrulla	1011	17	14
Poochera	1008	10	7	Wolowa	—	—	—
Port Broughton	*	16	14	Wookata	—	—	—
Port Elliot	†	21	18	Wudinna	—	—	—
Port Germen	*	23	21	Wynarka	—	—	—
Pygery	*	17	14	Yacka	—	13	17
Rameo	†	19	16	Yednarie	—	13	17
Rapide Bay	1014	3	7	Yallunda Flat	—	—	—
Redhill	1001	—	—	Yanure	—	—	—
Rendelsham	*	14	11	Yeelanna	1011	17	14
Renmark	†	15	12	Yongala Vale	—	—	—
Riverton	*	—	—	Yorketown	—	—	—
Eiverton (Women's)	*	—	—	Youngusband	*	22	19

* No report received during the month of April. † Held over until next month.

A.M. Annual Meeting.

† Formal.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD)

MORCHARD (Average annual rainfall, 13.50in.).

March 22nd.—Present: 15 members and visitors.

QUESTION BOX.—The meeting took the form of a Question Box and Exhibit Evening. The first question to be considered was, "What is the cause of flag smut in wheat?" This question was well discussed, and the decision arrived at by the majority was that the disease was encouraged by lack of moisture at a certain stage of the growth of the plant. "Can we continue to grow wheat at present prices, under the present high cost of production?" All the members spoke freely for the negative, and said if it were not for side lines, such as sheep and cattle, wheatgrowing would not be a very profitable occupation. "Is the weed 'squash melon' useful for sheep feed?" Mr. H. Kupke said the plant made splendid sheep feed, although there had often been statements to the contrary. Sheep had been placed in fallow paddocks containing rank growths of the plant, and in several weeks the sheep were in prime condition, the plants having been eaten off to the roots. "The best winter fodder for sheep?" Mr. F. Seriven favored barley, but, owing to the trouble caused in subsequent crops, he had discontinued growing it. Mr. H. Kupke spoke in favor of barley, saying that if proper care was exercised the barley would not spread into other cereal crops. The best plan was to eat it right out. Mr. H. Tilbrook favored a good variety of oats. Oats, although not so quick in getting away as barley, would not be detrimental to a crop of wheat, because they fell before harvest operations. "Whether it would not be better for the farmers to manage their own financial operations, and arrange to dispose of their produce, wheat, wool, &c.?" Members replied in the affirmative, believing that if a competent manager were placed at the head of a live co-operative scheme, farmers would obtain more remunerative prices for their produce. Mr. H. Kupke tabled a fine exhibit of Dunn's Seedling apples and Ponderosa tomatoes.

WEPOWIE, March 18th.—Mr. A. E. Matthews contributed an interesting paper, "English v. Australian Methods of Farming." An article dealing with the subject "Red Wheats" was read from the *Journal of Agriculture* by the Hon. Secretary (Mr. W. J. Smith).

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT)

REDEHILL (Average annual rainfall, 16.79in.).

March 18th.—Present: 10 members.

CARE OF HORSES.—In a paper on this subject, Mr. H. J. Crouch said that the humane treatment of animals not only contributed to their comfort, but promoted their physical welfare and enabled the owner to get the largest amount of labor from them. Farm animals, especially horses, belonging to a cruel, solvenly, or miserly farmer were rarely in a condition to perform the most efficient labor. Horses should not be pampered, but they should be made as comfortable as circumstances would permit, and provided with a sufficiency of good quality food.

and clean water. The owner should also see that they were not abused by beating. If the horses had not been broken in spirit they would not need whipping. He then emphasised the necessity for breeding from only the best animals. A good discussion followed the reading of the paper.

TARCOWIE (Average annual rainfall, 15½in.).

March 19th.—Present: 16 members.

HARVEST REPORT.—Mr. E. Harvie, in detailing some of the outstanding features of the past harvest, said the 1923-4 season was a good one. The total rainfall was 22½in., of which 16½in. fell at opportune intervals during the growing period. Cool weather was experienced during November, thereby making the conditions ideal for the hay harvest. One hundred and fifty-four acres were reaped from crops sown on fallow land before the first seeding rains fell and returned an average yield of 21bush. to the acre. The remaining portion of the fallow—190 acres—was sown after rain had fallen, and averaged approximately 24bush. Pridgeon of place was gained by "Currawa," which yielded 30bush. to the acre sown after the rain.

NARRIDY, March 1st.—Several subjects of local interest were brought forward for the consideration of members, special attention being given to the matter of the inauguration of crop competitions.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BETHEL.

March 11th.—Present: 13 members.

CARE OF FARM MACHINERY.—In a paper on this subject, Mr. S. F. Geue said farm machinery was so expensive that the farmer should take every reasonable care of it. When the harvester or binder had finished work in the field it should be taken to the homestead immediately and placed under cover. Before commencing work in the paddock, each machine should be overhauled, and all worn and broken parts replaced, and oil holes and bearings cleaned out to take the oil. When the binder or harvester was working, every part should be kept well oiled. It was a good plan on rainy days to go over the harvester or binder, and tighten all the bolts and nuts, and ensure that all the parts were in proper working order; that precaution would save hours during the busy time of the year. Special attention should be paid to the pinions; if they were inclined to slip they should not be worked, because they would spoil the crown. When the crops had been reaped, the harvester should be taken into the shed, and a prop placed under the off side of the comb to keep it level. When ploughing or cultivating on hilly land it was preferable to use axle grease instead of oil, because the latter ran out when warm, and did not give the axle the proper lubrication it required. He suggested placing either a piece of bag or tin over the inside of the axle to keep oil from running out, and dust or sand from getting into the axle. Mr F. H. Geue explained that whenever possible it was a wise procedure to have oil or grease caps placed on the plough or cultivator axle instead of the ordinary pin. That would keep the wheels tight, and prevent the oil and grease from working out. An interesting discussion followed the reading of the paper.

NANTAWARRA (Average annual rainfall, 15.90in.).

March 20th.—Present: eight members.

JOHNSON GRASS.—In the course of a short address dealing with this subject, Mr. R. P. Uppill said he had been growing Johnson grass for three years. Sheep especially, were fond of the grass, and although it could be grown under a wide variety of conditions, he was of the opinion that best results were obtained from land of a sandy nature. The seed, if sown through the drill at seeding time, would not germinate until October, and the plants would die off at the approach of winter, but a fresh growth would be made during the following summer. Fallowing or discing did not destroy the plants. He thought Johnson grass increased the carrying capacity of sandy land, and thereby added fertility to the soil. About 5lbs. of seed would be sufficient to sow 30 acres.

The New Rugby Car



THE widespread enthusiasm which greeted the introduction of the New Rugby Car still continues to rise in unprecedented fashion, surpassing even the wonderful reception accorded the original Rugby Car.

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OWEN.

March 5th.—Present: seven members.

HARVEST RESULTS.—Mr. W. J. Marshman contributed the following paper on this subject:—“The opening part of the year 1923 was one of the driest experienced in this district for many years; practically no rain fell over the greater part of the surrounding district from January 1st until May 1st. Light rains then fell, and for the first three weeks in May seeding conditions in this district were ideal. Towards the end of the month heavy showers set in and continued through June and July, when we experienced some of the wettest weather known to the oldest residents in the district, consequently seeding operations were seriously delayed, the fallows became quagmires, and those up-to-date farmers who waited for the weeds to grow before seeding were unable to sow a crop, and others were unable to complete the whole of the area intended for sowing. On scores of farms the wheat was simply bogged in. For the greater part of the season, with the exception of about three or four weeks in the spring, the weather continued showery until the end of the year; yet, notwithstanding all the handicaps and the excessive wet season, the harvest results not only came up to expectations, but in the majority of cases exceeded by far the results of previous years. Some of the best averages over large areas of wheat left for the harvester were gathered in, and yields of from 30bush. upwards are reported; frequently in some cases 40bush. and over have been reached. It is noteworthy that year by year our farm averages for grain are steadily on the increase. This fact can be attributed to better methods of cultivation, the sowing of a better class of seed, and the application of heavier dressings of superphosphate. With regard to hay results, this district has cut, not only the heaviest tonnage of hay as a district, but this season we have cut the heaviest tonnage per acre ever cut to date. In the past from 2 tons to 2½ tons per acre was a splendid return; this season has eclipsed all others in that 3-ton crops are by no means uncommon. Good tillage, heavy dressings of seed and super, the growth of more suitable hay varieties, and the abundant rains all contributed their part in making ‘harvest results’ a new record for the district. In regard to the most suitable varieties of wheat for grain in the surrounding district, on the western side, three varieties in particular appear to stand out very prominently, viz., Early Guyas, Ford, and Sultan. There can be no question about Early Guyas being the best all-round wheat in the scrub and light country, notwithstanding its liability to go down very badly. Farmers west of Owen over a number of years have had no wheat to equal, leave alone surpass it, for its ability to withstand drought and to fill the bags. This wheat was selected many years ago by Messrs. Guyas, of Telowie, from a wheat named Wards. What Federation has done for the farmer in the Wimmera, Victoria, Guyas has done for the farmer, especially on the lighter soils of South Australia, and not only in South Australia has it become very popular, but it is showing splendid returns in some of the other States. We are indebted very much to the Roseworthy Agricultural College for keeping this variety true to type, for by very careful selection they have been able to keep up the very high yielding qualities of this wheat. Ford has put up some splendid records for the past three years both on the heavier and lighter types of soils. Six years ago I received the first small parcel of Ford from the Roseworthy College, about 5lbs. in all, having seen it in the small plots at the College. In 1918 I stripped the first little plot, which yielded so well that I decided to try it the following year. That year (1919) was very dry towards the close, and many poor crops were harvested in the district. Ford gave per acre 9 bags of beautiful and plump grain. The next time I harvested Ford it gave me 10 bags per acre, and since then it has spread all over the district, and has given some very fine yields; indeed, 11 and 12 bags per acre being frequently reported. Ford was bred at the Roseworthy Agricultural College, and is the result of the cross Fan and Comeback and Crossbred 53. Ford is an early mid-season wheat, stands up well but is a little inclined to shell with very heavy hot winds. Ford is one of the best yielding varieties of wheat that we have. Sultan is a dual purpose wheat bred also at the Roseworthy Agricultural College, and is the result of crossing King’s White with Caliph. Caliph is the result of King’s White and Marshall’s No. 3. This wheat also is a heavy yielder of grain. It is somewhat tough to thresh, and if sown too early in the season is liable to go down. To minimise the danger of going down, and to get better threshing and cleaning results, Sultan

should not be sown early in the season, and the harvester should be put into it as soon as it is fit to strip. My experience with Sultan has been that though not rustproof, it does not rust so badly as King's White or Red. It is a wheat well worthy of further trial. I wish to make special mention of another variety of wheat, one by no means new, because I can remember it being grown over 30 years ago, and that is Leak's Rust Proof. In the *Journal of Agriculture*, August, 1919, the Manager of the Turretfield Experimental Farm says 'Leak's Rust Proof should be classed with such old and hardy varieties as Guyas, King's White, King's Red, Federation, and one or two others,' and proceeded to say that it went out of fashion for some reason or other, and is only now coming in again. He says this variety is much too good to be neglected, being both a grain yielder and a really good hay wheat. Acting upon this advice, some three years ago, I procured eight bags of graded seed, and during the past three seasons as a bulk crop it has given me the best returns for grain of any variety I have grown on my farm. It might be classed as a late variety, but I believe it to be the hardiest late wheat I have grown up-to-date; it will stand dry conditions remarkably well, and will make very rapid growth during the spring months. It is a good stoker, does not go down or shed its grain with rough winds. More attention should be paid to this prolific variety. This wheat I believe to have been selected by the late Mr. Leak, of South Australia. King's White, King's Red, Sultan, Baroota Wonder, and Early Zealand Blue occupy, perhaps, the first positions among the early varieties of hay wheats, and Late Zealand Blue and Leak's Rust Proof among the late. Both King's White and King's Red were selected from Mr. Joseph King's King's Early by the Roseworthy Agricultural College. Baroota Wonder is a selection from Ward's Prolific. Unfortunately, some confusion now exists in respect to this wheat. Selection work has been carried out in Western Australia in respect to this wheat, and three so-called strains have been selected, namely, Turvey, Baroota Wonder Early, and Baroota Wonder. Turvey is purple strained, while Baroota Wonder Early and Baroota Wonder are

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both white strained wheats. In my opinion only the one type of this wheat should have been strictly adhered to, and all efforts concentrated towards refining and improving one particular type as the standard type of Baroota Wonder Zealand Blue, or what is known as Crossbred 53, is a Western Australian wheat, and we now have the two strains, early and late. Both are very hardy varieties, and stand dry conditions very well, and, under ordinary circumstances, will cut dense crops of hay. The late variety, in particular, is exceptionally sweet in the straw, stock showing a decided preference for it. With regard to Leak's Rust Proof, three years ago, when rust was very bad in this district, and most other varieties were badly discoloured in the straw, Leak's was almost free from rust, and retained its bright green color, making an attractive hay for the chaff merchant. I would strongly advise farmers in hay districts to give this variety a trial." During the discussion which followed, Mr. Bowyer stated that Scotch Grey and Algerian oats had yielded over three tons per acre on stubble ground. Mr. B. S. Harkness stated that Sultan had yielded very satisfactory results for hay and grain. The new wheat Dan averaged 38bush. per acre, and Nabawa gave splendid promise.

SADDLEWORTH WOMEN'S (Average annual rainfall, 19.69in.).

March 18th.

Mrs. Newmann contributed a paper, in which she gave an interesting description of the river settlements from Morgan to Waikerie. Miss Frost also read an instructive paper, "Station Life at 'Warrakoo,' River Murray, New South Wales." Miss Frost exhibited a fine collection of photographs depicting various phases of station life.

TWO WELLS (Average annual rainfall, 16.36in.).

March 29th.—Present: six members.

CARE OF WOODWORK.—Mr. E. J. Wheller contributed a paper on this subject. If a piece of wood, which had been cut across the grain, were examined, he said, it would be noticed that it was more or less porous, according to whether it was a soft or a hard wood. Those pores gave the wood its elasticity, but if they were allowed to become broken down or rotten the wood lost its strength. If the wood were exposed to all weathers, the pores would soon become broken down owing to the continual expansion and contraction of the pores caused by the alternate damp and dry atmosphere. It was therefore necessary to put a covering over the wood to protect it from direct exposure to the atmosphere. Paint was one of the best substances for that purpose, it not only kept out the weather, but prevented the sap or natural moisture in the wood from evaporating. It was necessary, therefore, to ensure that the woodwork was well covered with paint, and all vehicles exposed to the weather should also have a fresh coat every second year at least. That not only prolonged the life of the vehicle, but saved a considerable amount of time lost in screwing up bolts that became loose owing to the breaking down of the pores. In addition, paint also gave the woodwork a pleasing appearance, and he thought it was their duty to make everything on the farm as pleasing to the eye as possible. For the better class of work there were different grades of ready mixed paint and varnishes on the market, but it was not generally known that coal tar could be used to take the place of paint for the rougher class of work, such as gates and vehicles that were used only on the farm. Instead of warming the tar to make it work easily, it could be thinned down to the consistency of paint by the addition of benzine. It could then be applied more easily and quickly, and would dry more quickly than tar in its natural state. By the addition of red oxide the tar could be made a desirable brown color, or a bronze green color could be obtained by the addition of yellow ochre. The outbuildings, such as the cowsheds and bails, pigsties, &c., should be given a coat of whitewash occasionally, both from the point of view of appearance and sanitation. Well slaked lime made one of the best washes for that purpose; 2lb. of alum should be dissolved in boiling water and added to a bucketful of whitewash. The mixture should be applied thinly, two coats being required. Many persons used the wash when too thick, and did not add a sufficient quantity of binder, consequently the wash appeared very patchy. Another very good wash was made by mixing cement with fresh separator milk to about the consistency of paint.

CLARE, February 22nd.—A paper, "The History of Viticulture," was read by a member, and an interesting discussion followed.

LIGHT'S PASS, March 20th.—A paper, "Vine Growing," which had been prepared by Mr. S. Ellis, was read by Mr. L. Koop. The paper raised several interesting points and a keen discussion resulted.

OWEN, March 25th.—The Hon. Secretary (Mr. R. S. Harkness) read a paper from the *Journal of Agriculture*, "Tillage of the Soil," which aroused an instructive discussion.

STOCKPORT, March 21st.—Fourteen members and visitors attended the March meeting, when Mr. D. L. Stribling, who had recently made a trip to Loxton and Renmark, gave an interesting address, in which he referred to the agricultural and horticultural practices carried out along the river.

YORKE PENINSULA DISTRICT.

(TO BUTE)

BRENTWOOD.

February 28th.—Present: 13 members and five visitors.

HARVEST REPORT.—Mr. J. J. Honner, who read a paper dealing with this subject, first referred to the abnormal weather conditions which prevailed during the past year, and especially during the seeding season, with the result that a large area of the crops were "bogged in"; 18.07 points of rain were received for the 12 months, and Mr. Honner considered that an annual precipitation of 12in. at favorable intervals would have given, generally, better results. For the district he estimated the average yields to be 21bush. per acre for wheat, 18bush. per acre barley, 27bush. per acre for oats. Hay yield—wheat on fallow, 2 tons per

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acre; oats, 2 tons per acre; oats on stubble, $1\frac{1}{2}$ tons. The grain sample was irregular, many varieties of wheat which in normal years produced good sound, plump grain yielded pinched and light grain, which weighed in the vicinity of 150lb. to the bag. Generally speaking, the sample was free from chaff and foreign seeds. Barley, although of a superior quality to previous years, contained a considerable amount of oats, mustard, cocksfoot, which, no doubt, was due to the difficulty experienced in dealing with weeds, owing to unfavorable cultivating conditions. Most of the prime barley was ruined through being threshed too closely. The oat sample was only fair, containing large quantities of barley, in some instances farmers were guilty of marketing grain in old corn sacks. That was false economy, because any losses caused through broken bags, &c., reverted to the producer. "Currawa" Mr. Horner considered to hold pride of place as regards the best varieties of wheat for the district, with "Ford," "Nugget," "Major," and "Queen Fan," following in the order named. In the course of the discussion which ensued, Messrs. R. G. Anderson and A. E. Twartz said farmers should be compelled to use sound corn sacks, because all the producers would have to suffer through the fault of a few. Mr. F. L. Carmichael thought the skinning or close reaping of the barley was due to the exceptional weather conditions, the grain was soft, and great difficulty was experienced in reaping it without doing any damage to the grain. Mr. R. Anderson advocated opening the machines and using fewer sieves in the harvesting machinery to remedy the close reaping. Mr. A. E. Twartz agreed, and said barley was not blown out of the machines, but carried over because the sieves became overcrowded.

WEAVERS.

March 10th.—Present: 10 members.

DESTRUCTION OF FOXES.—Mr. W. Anderson read the following paper:—"Of all the pests with which the farmer in this district is troubled at the present time, the fox is undoubtedly the worst. The fox is useful in that it kills rabbits and mice in the paddocks, but the damage that it does in other ways more than counteracts any good that can be claimed. Poultry, unless always securely enclosed, will be taken by the fox; but the damage that this pest does during lambing season is very severe. Each fox, on an average, kills a lamb a night, and perhaps more than that. The weaker the ewe the more liable it is to lose its lamb. It is of no use poisoning a lamb after a fox has killed it, while there are plenty of live ones about. The best plan is to distribute the poison before the lambs come. Drag a trail just after sun down, and lay poisoned baits such as birds or pieces of liver. If farmers organised during March, and did all they could to destroy foxes by poisoning and other means, such as fumigating and filling in the holes, there would be a better percentage of lambs than at present. At the present price of sheep it would pay to raise a fund and pay scalp money for a month, and so induce others to destroy the foxes. Every fox killed would mean many more lambs."

ARTHURTON. March 19th.—Fourteen members and several visitors were present at the March meeting when local topics, including the Maitland Conference, crop competitions, &c., were brought forward for discussion.

WESTERN DISTRICT.

POOCHERA.

March 1st.—Present: 15 members and three visitors.

DESTRUCTION OF RABBITS.—Mr. M. Prowett read the following paper:—"The destruction of rabbits should be looked upon as one of the important jobs on the farm, and when the time is opportune, other work should be laid aside, and no efforts spared to destroy the vermin. Many farmers make no attempt to deal with the rabbits until after seeding, depending upon either bisulphide of carbon or traps to eradicate the pest. For pastoral purposes or where the country is over-run with rabbits, the poison cart is very useful, especially in certain seasons and under certain conditions. In a season with a dry summer, when there is no green feed in the fields, the poison cart, if used after the first rain, will kill a very large proportion of the rabbits, especially if showery weather

continues for a day or two afterwards, the rain keeping the poison soft and making the rabbits hungry. Under average conditions, however, I prefer the heaping up or mounding of the burrows, which should be done when the ground is quite dry, so that the earth will run freely. This work is more easily done and more successful where the ground is of a sandy nature, but may be done quite successfully in fairly heavy loam, too, if a little care is taken to break the lumps and get the finest dirt available, that which the rabbits have scratched out of the holes being excellent for the purpose. It is necessary, or at least advisable, to go around all the burrows again the second or third day, and repeat the work on any holes that have been reopened. On a farm where the rabbits have been kept within bounds, this mounding should not occupy more than a couple of days at the most, and very few rabbits will be left. Then, after seeding, the first thing to do is to go around all the cropped land and ascertain where there are still odd rabbits. These may be caught with a dozen or so spring traps." In the discussion that followed, Mr. A. Milman considered the best way to get rid of rabbits was to wire net an area and kill the rabbits inside by filling in the burrows and distributing poison. Mr. V. Newbon considered filling in the burrows on a large holding would occupy too much of the settler's time. Mr. Prowett explained that a single-furrow plough would be a great advantage and save a lot of time in filling in the burrows. Mr. W. Gosling thought open bush country was only a breeding ground for rabbits, and should be cleared and ploughed as soon as possible. Mr. S. Joy had obtained good results from raspberry jam and oats treated with strychnine, together with filling in the burrows.

TAKE-ALL.—The following paper was read by the Hon. Secretary (Mr. S. Joy):— "Take-all is a fungus which is to be found in almost all of the light soils on the West Coast, and, in fact, nearly all over South Australia, and if the cultivation given the soil is favorable for the increase or spread of the fungus, the third year's crop will, as a rule, show signs of take-all. The disease seldom appears on fallowed land, even though the fallow has received no other working than that

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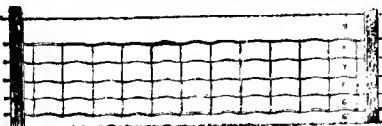


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with the plough at fallowing time. The fact that take-all is most severe in light soils would appear to point to the fact that there is something in the way of plant food contained in heavy soils which is absent in lighter soils. Therefore, it is necessary to work the land by fallowing and cultivation to try and produce the necessary plant food to prevent the growth or spread of the take-all fungus. For that purpose, I prefer to plough in as much green grass or rubbish as possible while the ground shows no sign of take-all. To accomplish this it is necessary to give the grass eight or ten weeks' growth before starting fallowing, and then work the harrows as soon as possible. With that end in view, warm weather should be chosen for the work, because the plants not covered by the plough and disturbed by the harrow would soon die off. To minimise take-all, farmers should endeavor to keep the fallow free from barley grass, if two or three crops are to be grown before fallowing again. Of course, there is the rotation method of cropping, but that is beyond most of the farmers who have a limited area of land to work, and limited capital to spend in clearing land. Again, heavier dressings of super are too expensive, and, after all, it is only a check to the disease. If either of these two methods is adopted, the farmers will be no further advanced than by fallowing, and the extra working of the land will more than compensate for the labor by the heavier return received, and without any extra expense regarding super. The fact that take-all does not affect oats is no proof that this crop kills take-all, and if barley grass is thick in the oat crop it is certain that take-all will be prevalent. Where there is barley grass there is take-all, and the land requires frequent fallowing and cultivating to keep the disease in check. If the land has shown signs of take-all, it is advisable to burn the stubble as soon as possible so as to destroy the food which it is living upon, for take-all will live and increase rapidly if affected stubble or grass is ploughed in, and will probably cause heavy losses in the following crop. Burning would only apply where take-all has made an appearance, for on land free from take-all there are many advantages to be gained by ploughing in stubble or grass. I advise burning and fallowing land that has shown signs of take-all, and it is a mistake to burn and plough and sow a crop during the same year. I would suggest one year of fallow on affected land." An interesting discussion followed. The meeting then took the form of a "Free Parliament," when several other subjects were introduced for the consideration of members.

ROBERTS AND VERRAN.

February 21st.—Present: six members and visitors.

BURNING.—Mr. S. Simmons read the following paper:—"If we consider for a while the advantages to be gained by a good burn, both scrub and stubble, it will readily be seen that it is essential, and more especially on farms such as we have in this district. Scrub should be rolled as soon as possible after seeding, then left until the middle of February, so that the shoots will receive another check by the fire, thereby giving the crop a better chance. Great care should be exercised in burning grass or stubble paddocks, especially if they are joined by grass or stubble paddocks belonging to a neighbor. Every farmer should minimise the risk of fires getting out of control by making fire-breaks around the paddocks at fallowing time. For stubble it is advisable when haymaking to cut a strip around each paddock, thus eliminating the difficulty of ploughing through straw. For light stubble, which will not run a fire, the fire-rake should be used. When this is necessary, every advantage should be taken of good days, because the success of the following crop depends very largely on a good burn. The best results are obtained by working across the wind; for example, if the wind is blowing from the north, to work east and west is the better way. By this method the heat of the fire will not appreciably affect the horses or driver. In the discussion that followed, Mr. H. Simmons favored burning as early as possible. He thought it a good plan to plough the ashes in, because they added to the fertility of the soil. Mr. C. Masters said fire not only killed shoots, but also checked the spread of "take-all." He favored burning scrub as early as possible to avoid the risk of the timber becoming too wet. Mr. F. Masters said a good fire tended to check "take-all." He did not favor burning on clear land, because he did not think the increase in wheat would compensate for the loss of feed. He thought scrub should be rolled before harvest, because the fire

checked the growth of shoots to a greater extent after they had shot from the stump than was the case if the scrub was rolled just before the fire. Mr. B. Evans said that if scrub was rolled about 18 months prior to burning a greater percentage of stumps was killed, although, as a rule, it did not make such a clean job of the sticks as would be the case if burnt earlier. He favored fire raking with the wind blowing at an angle. He did not believe in burning grass on a clear belt.

YEELANNA.

March 22nd.—Present: 13 members.

CARE OF HORSES.—Mr. L. Gentle, who arrived 12 months ago from England, read the following paper:—“Although tractors are the boom of to-day, it will be a long time before the horse is displaced on the farm. To obtain the best work from the horses they should be well cared for and studied. The stable should be kept clean and well drained, each horse having a separate stall where it can be tied up whilst feeding, except at night, when it is advisable for it to be loose. To prevent sore shoulders, a horse should have a well-fitting collar, which should be brushed or scraped once a week. The animals should be groomed daily. This, I believe, refreshes them, and prevents sores. During seeding and fallowing, feeding the horses four times a day—morning, mid-day, sundown, and 10 p.m.—on hay chaff and a handful or so of oats, keeps them in good condition. The water supply should be about 20 chains away from the stable. I am in favor of watering the horses at dinner time. Last, but not least, do not drive a working horse in the buggy.” In the discussion that followed, Mr. J. Wagner said time spent in grooming horses was time well spent, because it not only refreshed them but also helped to keep them in good condition. Mr. A. Skipworth thought that where a man had about 20 horses to groom, it would not pay to waste time grooming them. Mr. F. Roediger said he did not believe in giving horses too much oats, because the oat chaff in that district had a good deal of grain in it.

FOX DESTRUCTION.—Mr. A. Skipworth proposed that members of this Branch start to poison foxes the first week in April. All members agreed to the proposal. Mr. J. Lawrence said he had been poisoning foxes for two years, and had secured good results with sparrows treated with soda and poison as baits. He poisoned 30 foxes last year with the sparrow bait.

BUTLER., March 17th.—Mr. C. F. Jericho gave a report of the results of the Government experimental plots conducted under his supervision at Butler. The subject, “The Tod River Water Scheme,” was also brought before the meeting.

LIPSON., February 15th.—Several subjects of timely interest were brought before the meeting, and a keen discussion ensued.

PETINA., February 23rd.—A discussion took place on the proposed crop growing competitions. The price of seed wheat was also discussed by those present.

WIRRULLA., March 15th.—Mr. F. A. Doley read a paper, “Experiences with Underground Tanks,” and a keen discussion followed.

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[May 15, 1924]

EASTERN DISTRICT.

COONALPYN (Average annual rainfall, 17.49in.

February 22nd.—Present: eight members and two visitors.

COVERING STACKS.—Mr. F. Pitman contributed an interesting paper on this subject. The writer favored iron sheds. They lasted well, and provided catchment for a great amount of water. An interesting discussion followed. The consensus of opinion was that it was desirable to erect a shed to cover 30-40 tons of hay, and to thatch the remainder, the idea being to cut from the shed in wet weather, thus saving time during busy periods. Mr. J. J. Angel then gave a short address on "Burning." He favored burning as late as possible, preferably during March or later. During the discussion, several interesting points were brought forward. Mr. Cronin favored an early burn—January, or even earlier, if possible—contending that the longer the period between the time of burn and the winter rains the greater the check on the shoots. Mr. Pitman favored burning as late as possible, and recommended running the harrows over the ground as soon after the fire as convenient, thereby helping to keep down the tendency of the ashes to drift.

LONE GUM AND MONASH.

January 16th.—Present: 25 members.

RAISIN DRYING.—Mr. H. Berriman contributed a paper on this subject. When selecting the ground, the first thought would be the dry block, he said, but unless that was composed of fairly heavy, hard land, and was comparatively free from dust, it would be a mistake to place the racks there. So far as the actual drying was concerned, dust was the greatest nuisance they had to contend with, and there was usually plenty of that on the dry block after one had been over it a few times with a horse and cart. He had his racks on the dry block, but if he had to build them again, and had a lucerne plot on the irrigated block, he would place his racks there. Another evil which it was well to avoid was having the drying ground too near a road over which much traffic passed. If one had no alternative but to build the racks on the dry block, he thought it would be advisable to have the dip on the western corner of the northern end of the racks, so that it could be approached from the west. In the drying season most of the wind came from either due west, south-west, or from the north, and with the dip placed in that position most of the dust raised whilst carting in would blow away from the racks. In the past, the man with the poor sample got almost as much for his fruit as the man with the good sample, but under the new method of grading those who were careless in drying would pay for their neglect, and only those who produced the best sample would receive the best price. During recent years quite a number of innovations had come into being in the way of alterations, or improvements, in drying racks. He thought, however, most of those had been brought in with a view to economy rather than to an improvement in the quality of the finished article. He was speaking of racks with a greater number of tiers than the majority of racks in that district and elsewhere. He agreed that a rack of that kind was economical in the way of timber and iron, but whether that economy was realised in actual practice he was not prepared to say. He thought, however, that fruit on a rack of that kind would take longer to dry than if it were on a rack with a lesser number of tiers. He thought, too, that, owing to the longer period required for drying, it would militate against quality, and, further, in a bad season the losses would be greater than on the more open rack. The rack he favored was one constructed with five tiers of 4ft. netting, the tiers being 13in. apart. It was immaterial whether the rack was fixed or movable, unless it was required to stack wheat under during the winter when he would prefer to have it movable. Picking.—There were various methods of picking fruit. Some fruitgrowers picked direct into the dipping tins in order to prevent further handling, and others into kerosene tins, and others again into small picking boxes. Which of those was the best method he was not prepared to say. The majority of growers, probably not in Berrim, but elsewhere, picked into dipping tins. That method certainly saved a lot of time and also reduced considerably the quantity of loose berries, and was very economical. Picking into boxes or kerosene tins meant emptying the fruit into dipping tins at the dip, and besides adding considerably to the number of loose

berries that method meant keeping another man at the dip. Picking into kerosene tins and emptying into dipping tins at the dip might improve the grade, but he would not guarantee that. He had always been used to picking into dipping tins, but he intended trying both this year, and if the grades came out the same he would have no hesitation in saying that picking direct into the dipping tin was the better method. Because number of loose berries fell during the process of picking it was necessary to have something under the vines to catch them. Last year he had two galvanized trays made, measuring 4ft. by 2ft. by 2in. deep. These answered the purpose satisfactorily, but a 3ft. by 2ft. tray with a cleat nailed on each side and a piece of tin around each corner would serve the purpose. He always had the tins put out in the middle of the rows, two rows in one, and went up the next row and had the tins handed over the trellis when loading, because if the cart were taken up the same row as the tins they would necessarily have to be pushed under the rows, and sometimes some of them were missed. It was not advisable to commence picking too early, because much weight would be lost in that way. *Dipping*.—The usual strength of the dip for sultanas was about 1lb. of caustic soda to 25galls. of water. That varied according to the toughness of the skin, which in turn was governed by the weather conditions. Possibly, as the season advanced and the skin became tougher the dip would need to be stronger, but 25 to 1 was a good guide to begin with, and could be weakened or strengthened according to the effect it was having on the grapes. Gordos could be commenced at double that strength. The temperature of the dip should be at boiling, or as near thereto as possible. *Cracking*.—So long as one could see any cracks, no matter how small, around the end of the grape which was attached to the stem, one could rest assured that the dip was strong enough. If any other part of the grape were being cut too much, the dip needed weakening. *Spreading*.—That should be done as evenly as possible, one bunch thick, and any bunches that were too large or too thick should be broken up. Rubbing off should not be attempted until the grapes were nearly dry. If it were carried out too soon, the skin would break and the fruit would become sugary and sticky, and spoil the sample. He did not believe in leaving the fruit on the rack until fully dried, because he thought a day or two on hessian evened up the color and improved the grade. Also, he did not think it advisable to have the hessians more than 9ft. or 10ft. long, because, if longer they would contain

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too much fruit and were difficult to handle. Quality should be their slogan in future, and that could only be attained by careful handling and thorough drying. Care should be taken to ensure that the fruit was thoroughly dried before delivery to the packing shed. Currants should be picked into kerosene tins, because if they were picked in dipping tins one usually got a quantity of sand mixed in with them. Currants should not be spread too thickly, though they could be spread a little more thickly than sultanas. In order to procure the best results, side curtains should be put on the racks immediately and kept there until the currants were ready to put on hessian. That helped to darken any red berries and evened up the grade.

MYPOLONGA, March 17th.—To an audience of 14 members and a large number of visitors, the Assistant Dairy Expert (Mr. H. J. Apps) delivered an address, "Important Points of the Dairying Industry." At the conclusion of the address Mr. Apps replied to many questions.

NETHERTON, March 14th.—The members present discussed the different varieties of wheat grown in the district during the past season and the yields received from them. Two bags of Caliph were grown alongside the Viking and Budd varieties under the same conditions, but very little difference was noted until they were reaped, when Caliph averaged about 4 bush. more than the other varieties. Some of the members thought that wheat yielded better because it was new, and they were in favor of changing the seed every year or so.

NEW RESIDENCE, March 19th.—The subject for the evening was a paper, "The Drill and Cultivator v. the Combine," written by Mr. E. Schober. Nine members were present and all took part in the keen discussion which ensued.

SOUTH AND HILLS DISTRICT.

RAPID BAY.

March 14th.—Present: 21 members.

ROTATION OF CROPS.—The following paper was contributed by Mr. J. D. Lawless:—"New land should first be made free from all bushes and stampings during autumn or late summer, so that a good burn can be effected and the ground ploughed to a depth of 2in. to 3in. The land should be allowed to remain as bare fallow until the following season, when two crops of wheat can be successfully grown in rotation, providing the second crop has a dressing of about 20lbs. extra manure per acre. The best wheat to grow in this district is Marshall's No. 3 and Crossbred, both being good hay wheats. Oats should be the third crop, and after being harvested the stubble should be burnt during March, in order to kill the young stiukwort and sweeten the ground and free it from take-all. Barley should be the next crop, sown on well-worked soil the first or second week in August." The stubble should be fed to lambs, and they would do remarkably well, providing a small convenient enclosure was provided, and the lambs were fed at night on a ration of about 1lb. of oats to each. If pigs were grown the following year, such a crop would put the ground in good heart for wheat again. Half the pea crop should be harvested, and the pens kept on hand for the spring. The remaining portion of the field could be fed to pigs or sheep. "I prefer white peas in preference to the grey varieties. Garden vegetables should also be grown in rotation. Potatoes should not be grown more than twice in succession in the same plot, and if turnips are sown two crops could be grown in one year. I recommend White Duck clover as the best crop to grow on potato land. If the clover is ploughed in the ground in its green stage, potatoes will grow remarkably well, because it has a similar action to a heavy dressing of manure." An instructive discussion followed.

CHERRY GARDENS, March 18th.—The March meeting took the form of an "Exhibit Evening." An excellent display of fruit, including apples, pears, &c., vegetables, fodder crops, cut flowers, and useful articles for the homestead were tabled by members. Each member made a short explanation of his exhibit, which resulted in a very interesting meeting. Thirteen members and nine visitors, including a number of ladies, attended the meeting.

COTTNET RIVER, March 18th.—Mr. L. H. Mear read extracts from an article, "The Ministry of the Garden," which brought forward an interesting discussion. Several subjects of local importance were also considered by members.

MCLAREN FLAT, February 21st.—At the monthly meeting of the Branch, held on February 21st, the Viticultural Instructor (Mr. D. G. Quinn) delivered an address, "Downy Mildew," to an attendance of 45 members and six visitors.

SOUTH-EAST DISTRICT.

KALANGADOO WOMEN'S (Average annual rainfall, 33in. to 34in.).

March 8th.—Present: eight members and visitors.

QUESTION BOX.—The meeting held took the form of a Question Box. Mrs. Campbell asked for a good flavoring for rhubarb. Mrs. Tucker had found essence of almonds most suitable, and a small quantity of lemon juice added to rhubarb was a decided improvement. Miss Tucker asked what caused cakes to rise in the middle and crack when baked. Miss Hemmings thought that mixing the ingredients too stiffly would probably be the reason. Miss Tucker said that a teaspoonful of olive oil added to any kind of cake helped to make it richer. Mrs. Evans said that when making plum pudding she always added a fair-sized carrot, which helped to make the pudding richer, and fewer eggs were required. If fairly strong tea were used for mixing, instead of milk, the pudding would be much darker and of a better flavor.

TATIARA (Average annual rainfall, 19in.).

March 15th.—Present: 11 members and two visitors.

SUMMER FODDER CROPS.—Mr. H. T. Exton contributed the following paper on this subject:—"The thorough preparation of the soil before sowing is a most important factor in the growing of a successful summer crop. The most suitable class of soil is a good loam. Sandy soil—unless too poor—will grow payable crops, while clayey soil is the least suitable, and should be avoided if possible. The land should be ploughed as soon as possible after the seedling is completed, and worked as often as possible to kill weeds and form a good seed bed. It should be ploughed, cultivated, and harrowed down before the seed is sown. Unless the season is very favorable, ploughing the land immediately before sowing does not usually result in a successful crop. If possible have the seed bed firm underneath, and fine and loose on the surface. Sudan grass, which I consider the most reliable plant for summer growing, will not stand frost when young, and does not make much headway until the ground begins to get warm, so it should not be sown too early—about the middle of October is early enough—and good crops might be obtained by sowing as late as the end of November if the land is in good order and sufficient rain falls to germinate the seed. For a fair germination, 5lbs. or 6lbs. of seed per acre is sufficient. The seed should be mixed thoroughly with the super and sown through an ordinary seed drill. Level the mixture in the drill at intervals to ensure even sowing. If the ground is dry, sow as shallowly as possible, but if there is sufficient moisture within a couple of inches of the surface to germinate the seed it may be sown at that depth, unless rain is threatening, when it is best to sow shallow, because if the surface cakes before the plant gets through it may have difficulty in forcing a way through. Light drill harrows attached to the drill are suitable to cover the seed, but, if possible, drill and cover the seed in one operation, because by so doing less moisture is allowed to escape from the soil. Sudan grass is a good fodder for sheep, cattle, and horses, and in my experience is not poisonous at any stage of growth. It may be cut and fed green, or grazed. If intended as a grazing crop, stock should be turned on when the plants are about 15in. high, or as soon as the seed heads appear. If the stalks are too old stock will not eat them. Do not feed down too hard, because the crop will then make new growth, in fact, if not allowed to seed, it continues to grow right up till the cold weather sets in. This plant stands dry weather well and responds rapidly to any summer rains. Do not sow rape and Sudan grass together, or, if rape is sown, use very little, because if much comes up and the season is favorable, it will considerably check the Sudan grass. Japanese millet is also a good summer fodder, especially

for dairy cows, but in my opinion it does not give the same bulk of food, and after being fed down does not come again so well as Sudan grass. At different times I have had experience with several varieties of millet, but Japanese appears to be the best. During the growing period it requires the same treatment as Sudan grass, the same quantity of seed per acre should also be sown. A acre or two of thousand-headed kale, situated near the homestead, is very useful for feeding to the cows, pigs, and poultry. It gives the best results if sown in rows, about 3ft. apart, or wide enough to work a horse hoe or garden cultivator between. If a hand sower is not available, the seed may be mixed with super and sown through an ordinary seed drill. A piece of hoard should be fixed each side of every fifth star, in order to keep the super and seed from entering the tubes where not required. If sown in drills very little seed will be required to sow an acre. If the plants come up too thickly, thin them out as they grow to about 15in. apart, or even more, if the plants are large. Autumn is the best time to sow, but if sown in the early spring on well-prepared land, and the soil between the rows is stirred whenever it shows signs of setting, a good crop may be obtained. The crop can be grazed, but far more feed will be obtained, and the plants will last longer, if the leaves are pulled from the bottom of the plant and the crown is not allowed to become damaged. In a hot, dry summer kale is liable to be attacked by blight. Rape is a useful summer fodder for sheep, and is very fattening, but being liable to the attacks of blight, is rather an unreliable plant. It is said by experts to improve the land on which it is grown. Dwarf Essex is the variety usually grown. This year we tried a small plot of 'Giant Kangaroo,' but whatever it may do when sown in the autumn, there appears to be no difference between it and Essex during the summer. The seed should be sown as shallow as possible on a fine seed bed. For a summer crop 2½lb., or even less, of seed per acre should be ample, because if the plants are too close they do not stand the dry weather so well. A little white mustard seed sown with the rape lessens the risk of bloat. Mix the seed with the super and do not leave more in the drill over night than can be helped, because the acid in the super weakens the germinating power of the seed. Stock may be turned on seven or eight weeks after the crop comes up, or when the largest leaves begin to turn purple. If care is taken not to overstock, and the crowns are not damaged, the plants will continue to grow for a long time, provided occasional showers fall and no blight affects the plants. If a mixture is desired, a small quantity of Sudan grass may be sown with the rape. Sheep do not take to rape at first, but very gradually become used to it. When first putting stock on any of the above crops, care should be taken to ensure that they are not empty, or that the crop is not wet. If the stock eat the fodder ravenously, leave them on for one hour only twice a day till they become used to it. It is better to be careful than sorry. If possible have two plots, because there is less waste than if stock are allowed to roam over a large area, that also allows one plot to be spelled occasionally." During the discussion which followed, Mr. J. Elliot said he had tried Sudan grass, he fed it off five times, and then made hay of it, but the stock would not eat it. Mr. R. Wiese advocated smaller paddocks and summer crops followed by cereals. There was no reason why they should not receive two crops annually. He had 700 sheep doing well on 60 acres of Sudan grass and 20 acres of rape. Mr. H. T. Exton did not think a summer crop would be an advantage to the following cereal crop.

FRANCES, March 29th.—The Chairman (Mr. P. Pfizner) read an article "Rinderpest," from the *Journal of Agriculture*, and an interesting discussion ensued.

MOUNT GAMBIER, March 8th.—A discussion took place on the value of subterranean clover as a fodder for the South-East, and the President (Mr. A. Sassanowsky) read an article from the *Journal of Agriculture* dealing with subterranean clover.

NARACOORTE, February 9th.—Mr. W. E. Rogers read a paper, "Wells, Dams, and Bores," and an interesting discussion followed. During that portion of the meeting devoted to general business, Mr. Turnbull stated that an effective remedy for ants was to pour bisulphide of carbon in the holes inhabited by the insects. For cleaning cut glass and silverware a little petrol rubbed over with a clean rag and dried with another rag was an excellent recipe.

